RAILROAD GAZETTE

FRIDAY, JUNE 21, 1878.

Form, Proportion and Materials for Locomotive Boilers.

(*Continued from page* 293.)

[Report of Committee of the Master Mechanics' Association, presented at the Eleventh Annual Convention, in Richmond, Va., May 14, 1878.]

Mr. Towne invites criticism on the views he sets forth in his paper, and as some matters he presents may be new to many of our members, we present his paper, requesting that it be read to the convention, and that the matter contained be open for discussion. [Mr. Towne's letter, which was submitted with the report, is omitted here.]

To the question, "At what point on a straight boiler should the dome be situated, to give the best results, all things considered?" not much difference of opinion is expressed. All agree that it should be, either directly over the tube-sheet of the fire-box, or at some point between that and the middle of the length of the boiler. There seems, however, to be no good reason for locating the centre of the dome any further forward than the tube-sheet, in the ordinary eight-wheel locomotive, for the reason that it is desirable to carry as much of the weight of the boiler on the drivers as possible, and also that that point is the most central from the points where steam is generated.

THE BEST MATERIAL FOR FIRE-BOX SHEETS.

To this question, in former years, we received different answers; each year, however, from the time that steel began to be somewhat extensively used for fire-box sheets in coal-burning boilers, the answers were more decided in favor of steel. This year they are unanimous, and we consider, therefore, that no discussion is necessary as between its use and that of iron or copper for fire-box sheets in locomotive boilers.

It has not yet been determined, however, whether a very soft or low grade of steel, with a comparatively small proportion of carbon, is better than a medium grade of steel to stand the requirements best in service, and on this point your committee were unable to get any reliable data, other than that a number of master mechanics recommend a grade containing from $\frac{1}{10}$ to $\frac{1}{12}$ of one per cent. of carbon as being the best. For "open hearth" steel a proportion of $\frac{1}{8}$ to $\frac{1}{14}$ of one per cent. is recommended.

From the replies to the question as to the best thickness for the several sheets of the fire-box, we find that for tube-sheets $\frac{7}{16}$ in. and $\frac{1}{2}$ in. are almost exclusively used—more of the former than of the latter thickness—and no other sizes are recommended. For side-sheets and back-sheets all recommend $\frac{5}{16}$ in. as the best thickness, and for crown-sheets the same, except in two or three instances $\frac{3}{8}$ in. is recommended, yet no reason is given why the metal should be thicker for a crown-sheet than for a side-sheet. Your committee are unable to perceive why a thickness of $\frac{3}{8}$ in. is necessary in a crown sheet, when $\frac{5}{16}$ in. is the best for side and back sheets.

From the replies sent to your committee, we obtain a record of 992 steel fire-boxes in use on different roads in the United States for the past year, and during that time 90 sheets have ruptured or cracked. Of this number, 72 of them were side sheets, 4 back or door sheets, 10 tube sheets and 4 were crown sheets.

The percentage of sheets that ruptured to the number of such sheets in use on different roads was as follows: On one road 10 per cent. of the whole number of side sheets in use ruptured; on another, 8 per cent. of the side sheets, 1 per cent. crown, 2 per cent. of the tube sheets, and $\frac{1}{2}$ of one per cent. back sheets.

On another road 2 per cent. of side sheets cracked, and on another line 3 per cent. of the side sheets; and so on in about the same proportion on most of the roads reporting.

Rupture of the sheets occurred in almost every case when the sheets were cold or when firing up. The lowest mileage made, previous to rupture, was 75,000 miles, and the highest 152,000 miles. Mr. Woodcock, of the Central Railroad Company of New Jersey, mentions one case of rupture of a side sheet while the boiler was being filled with warm water, and as this is the first case of the kind coming to the notice of your committee, we give his statement of the circumstances. He says: "One thing I think remarkable; it occurred while the boiler was being filled up with warm water, the crack starting from a rivet in the mud-ring, going upward in the solid metal between two rows of stay-bolts a distance of about 15 inches." "It has been the opinion of some that filling the boilers with cold water was one of the causes of sheets cracking, but it did not prove so in this case." "The engine had been standing in the round house till the sheets had been thoroughly cooled off, and then cracked as I have stated." "The metal of this sheet was of crucible steel."

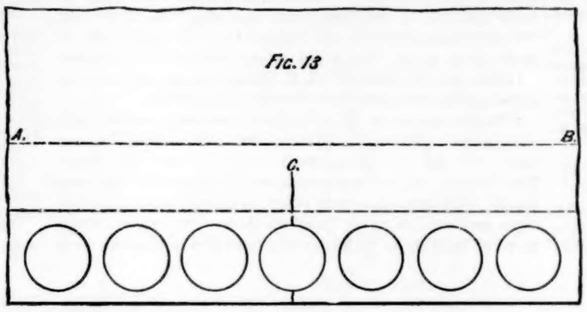
Your committee would submit the following as an explanation of this rather singular case:

The sheets of the fire-box and the mud-ring having cooled off to about the temperature of the surrounding atmosphere, water at a considerably higher temperature than the mud-ring was allowed to fill the water space; and as it rose upward along the sheet, the latter being thin, soon became of the temperature of the water in contact with it, and expanded in proportion to its temperature in the direction of *A B*, fig 13, while the much larger body of metal in the mud-ring remained comparatively cold, and being cold would be shorter than that on the line *A B*, which had become warm from the water in contact. The lower edge of the sheet would, of course, be of the temperature of the mud-ring to which it was riveted, and under a tensile strain from the expansion of the sheet through *A B*. This tensile strain seems to have been sufficient to rupture it through one of the rivet holes at *C*, and when started it extended upward in the sheet until the strain was relieved.

The cause of rupture in steel sheets arises from a difference of temperature in different parts of the same sheet at no great distance from each other. It is only the portion under tensile strain that *can* rupture, and it makes but little difference whether hot water is run into a cold boiler, or cold water into a hot one, the result is the same in either case, although the strains would come in opposite directions. For instance, if the sheet and mud-ring had been warm, and cold water was run into the boiler, cooling the thin sheet along *A B*, while the large body of metal composing the mud-ring remained warm, then the metal of the sheet on the line *A B* would have been under a tensile strain, while that at the mud-ring would have been under compression; and if rupture took place it would be at right angles to the line *A B*, and it would begin at that point, extending in both directions from it, but would not extend down as far as the mud-ring for the reason that at that point the strain would be compressive.

The general direction of the crack, in all cases reported, in side, back and tube sheets, was vertical, and all were in plain sheets, having no corrugations or channels, except in one instance—a case reported by Mr. Sedgley of the Lake Shore & Michigan Southern Railway, in which a crack occurred in a corrugated side sheet, taking a horizontal direction. Mr. Sedgley has a large number of boilers in use with the side sheets of the fire-box corrugated as represented in fig. 14, and while 8 per cent. of the whole number of steel side sheets in use on his road cracked during the past year, all were plain sheets except the one referred to above. Mr. Sedgley states that they have much less trouble with leakage at stay-bolts near the top of the fire than in the case of plain sheets.

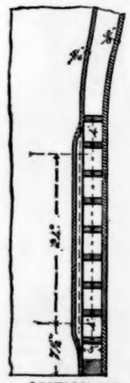
The chairman of your committee has in use steel fire-boxes in 20 locomotives on the Jeffersonville, Madison & Indianapolis Railroad, with channeled side sheets as represented in fig. 15, some of which have been in use nearly two years.



None have cracked or shown leakage at the stay-bolts, or any indication of injury from strain.

These channels are three-eighths of an inch in depth, beginning at the top of the mud-ring and extending upward

FIG. 14



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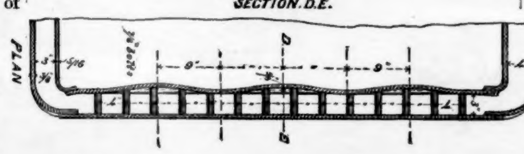
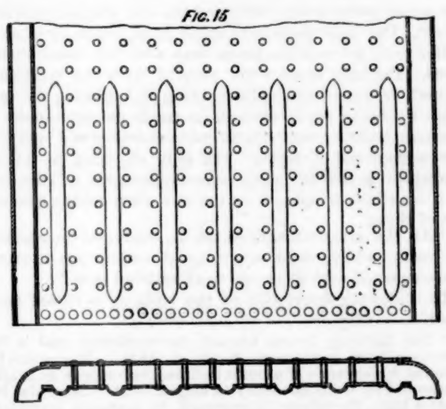
PLAN



about 30 inches, where they run out. They are placed between alternate rows of stay-bolts, as shown in the sketch.

The same facts have been brought out this year as were obtained last year and the previous one, in regard to ruptures

FIG. 15



that occurred in steel sheets; that is, that they occur mainly in the side sheets of the large and deep fire-boxes; that the crack is always vertical in its general direction, and not very far from the middle of the length of the sheet, and its starting point usually at a stay-bolt 6 or 8 in. above the grate, and occurs much more frequently when impure water is used (which forms a hard scale on the heating surfaces) than where the water is comparatively free from such impurities, and but little or no scale is formed, as in the case of the water used in boilers on some of the roads in the Eastern States, where rupture of the sheets seldom or never occurs.

Your committee set forth at considerable length in the report last year their views as to the causes that resulted in rupture in steel sheets, and we believe that the facts elicited since that time tend to confirm the correctness of their conclusions, and we deem it unnecessary to go into any further discussion of the matter in this report. We believe the remedy for this troublesome and expensive evil will be found, as we suggested in our last report, in corrugations or channels in the sheets, at points liable to such strains.

From our investigations we find that the cost of repairs of boilers is very largely influenced by the character of the water used in them. For instance, referring to this matter, Mr. Underhill, of the Boston & Albany road, says: "Our water is pure; we never take out the tubes to clean them, never blow off our boilers unless they need repairs. I have boilers that have not been blown off for months."

Mr. Coolidge, of the Fitchburg road, says: "The water used in our boilers is generally of good quality." "The deposit is mainly vegetable with the exception of that obtained in this city" (Boston). "After a service of six or eight years, the flues will be covered with scales of a thickness of from one sixteenth ($\frac{1}{16}$) to one eighth ($\frac{1}{8}$) of an inch."

Mr. Fuller, of the Atlantic & Great Western Railroad, says: "The water on portions of our road is very much impregnated with lime, and it forms scale very fast, compelling the removal of tubes and crown bars about once a year to clean off the deposits thereon."

Mr. Sedgley, of the Lake Shore & Michigan Southern Railway, states: "We generally find it advisable to change the tubes of engines after a mileage of about 20,000 miles." On the Wabash Railway it is found necessary to remove the tubes for cleaning after a service of about eighteen months, and on the Vandalia Line once in every two and a half years, and on the Jeffersonville, Madison & Indianapolis road after a mileage of about 80,000 miles with passenger trains and 50,000 miles with freight, for the purpose of cleaning the tubes and crown sheets.

Your committee are strongly impressed with the opinion that greater attention should be given to the quality of water used in locomotive boilers on many of the roads, particularly in localities in the Northern and Western States, and believe that it would be economy in the end to expend comparatively large sums of money in many instances, in order to procure water that is free from ingredients forming these injurious and objectionable deposits.

"o the question as to whether it is beneficial to use dead-plates, fitted closely to the sheets of the fire-box, flush with the top of the grate, of a width of three or more inches, on the sides and back end of the fire-box, so as to prevent the air from passing up between the sheets and coals on the grate, the answers were mostly in the negative; and we conclude that if there is any advantage in this plan, it is not a material one.

PROPORTIONS.

On the subject of the best proportions of boiler to cylinders of a given area, to furnish steam with the least consumption of fuel, your committee have received so little data that no positive facts can be deduced therefrom.

Mr. Johann, of the Wabash Railway, states that the proportions of boiler to cylinder in the locomotives on that road giving the best results are 15.7 square feet of heating surface in the fire-box (after deducting area of tube holes and fire door) to one cubic foot of cylinder, counting one stroke and both cylinders. Heating surface of tubes (counting inside diameter), 662 square feet, or 42.1 square feet of tube surface to 1 square foot of fire-box surface. The number of tubes was 131, 2 in. outside diameter, 11 feet long, with $\frac{5}{8}$ in. spaces between them.

The water spaces around the fire-box were $3\frac{1}{2}$ in. all the way up. Depth of water on crown sheet, which was of the sloping form, was 9 in. at the front and 13 in. at the back end, or an average of 11 in.

The quantity of water in the boiler at two gauges was 20.9 cubic feet to one cubic foot of cylinder, and steam space 6.3 cubic feet to one cubic foot of cylinder.

In the case of the boiler giving the poorest results, the proportion of fire-box heating surface to one cubic foot of cylinder was 14.1 square feet; the tube surface being 681 square feet, or 48.3 square feet of tube surface to one of fire-box surface. The space between the tubes was $\frac{5}{8}$ in., and their length 11 feet. The water space around the fire-box, 3 in. Depth of water on the crown sheet, which was of flat form, was 10 in.

At two gauges the boiler contained 17.4 cubic feet of water to 1 cubic foot of cylinder, and the steam space was equal to 7.2 cubic feet to 1 of cylinder.

The condition of the heating surfaces as to freedom from scale was the same in both cases.

The difference in the two cases named above was as follows: The boiler showing the poorest results had 11 per cent. less fire-box heating surface to 1 cubic foot of cylinder than the one giving the best results, while the heating surface of the tubes was 13 per cent. more. The water space around the fire-box of the boiler giving the poorests results was 16 per cent. less than in the one giving the best; the depth of water on the crown sheet 10 per cent. and quantity of water 20 per cent. less, while the steam space was 12 per cent. more.

Mr. Peddle, of the Vandalia Line, reports that the proportions of boiler to cylinder giving the best results on that road were as follows: 17 square feet of fire-box heating surface to 1 cubic foot of cylinder (counting both and the stroke of piston), and 42.6 square feet of tube surface to 1 square foot of fire-box heating surface. The number of tubes was 141; diameter, 2 in.; length, 11 ft. 2 in.; spaces between them, $\frac{5}{8}$ in. Water spaces around the fire-box were 3 in. at the bottom, and $5\frac{1}{2}$ at the top; depth of water on crown sheet, 8 in.: weight of water in the boiler, 1,571 lbs., or 21 cubic feet to 1 cubic foot of cylinder; steam space, 5.02 cubic feet to 1 of cylinder; water evaporated to 1 lb. of coal, 6.04 lbs.

The proportions of the boiler showing the poorest results were 15 square feet of fire-box heating surface to 1 cubic foot of cylinder, 41 square feet of tube surface to 1 of fire-box heating surface. Water spaces were $3\frac{1}{4}$ in. at the bottom and $3\frac{1}{2}$ at the top; depth of water on crown sheet, 8 in.; weight of water in the boiler, 988 lbs., or 13 cubic feet to 1 of cylinder; number of tubes, 122; diameter, 2 in., and length 11 feet, with $\frac{5}{8}$-in. spaces between them; water evaporated to 1 lb. of coal, 5.61 lbs.

The comparison between these two cases is as follows: The boiler showing the poorest results had 13 per cent. less fire-box heating surface than the one giving the best results; 4 per cent. less tube surface, 57 per cent. less water space around the fire-box at the top; while at the bottom the spaces were the same in both; 61 per cent. less water, while the steam space was practically the same per cubic foot of cylinder. The evaporation of water to 1 lb. of coal was 8 per cent. less.

The test as to evaporation was made in April, 1878.

The boiler showing the best results had made a previous mileage of 46,000 miles in passenger service since a new fire-box had been put in, while the one giving the poorest results had made a mileage of 62,000 miles in the same service, but the tubes had been removed, cleaned and reset one month previous to the test. The condition of the boiler giving the poorest results may therefore be considered to be the best of the two as regards scale on the heating surfaces.

Mr. Hayes, of the Illinois Central Railroad, gives the proportions of boiler to cylinder of locomotives in freight service on that road, that give the best results as to evaporation, the size of cylinders being 17×24 in. They are as follows:

Fire-box heating surface, 12.5 square feet to 1 cubic foot of cylinder, and 65 square feet of tube surface to 1 square foot of fire-box heating surface; 1,455 lbs., or 19 cubic feet of water to 1 cubic foot of cylinder; water space, $3\frac{1}{2}$ in. on sides and back at bottom; steam space, 11 cubic feet to 1 of

cylinder, the boilers being of the wagon-top pattern; number of tubes, 152; diameter, 2 in., and length, 11 feet. The evaporation of water in this pattern of boiler, with clean heating surfaces and the use of the semi-bituminous coal of Illinois, is about 5½ lbs. to 1 of coal, and if the boilers are badly scaled, it is as low as 3 lbs. to 1 of coal. The water used in the boilers on the Illinois Central road contains from 30 to 33 grains of solid matter to the gallon. On three sections of the road, it is necessary to remove the tubes once in every six or eight months for cleaning, and on the other divisions once in about 15 months.

The proportions of the boilers showing the poorest results are not given; therefore, no comparisons can be made.

The brick arch or other deflector was not used in any of the boilers between which the comparisons given above were made. All had the plain fire-box.

To the question as to whether any tests had been made in order to determine the temperature of the gases in the smoke-box under the different circumstances that occur in the every-day working of a locomotive, we received no reply; and as your committee failed to get the necessary apparatus in time to make any tests, we have nothing to report on that subject; yet we believe it to be a very important one, as determining whether there is a waste of heat from inefficient tube surface.

Your committee have received a very interesting paper from Mr. C. M. Higginson, Purchasing Agent of the Chicago, Burlington & Quincy Railroad, on the subject of combustion of coal in the locomotive, giving the results of a large number of tests made in a number of different locomotives, and under various circumstances, and which we present to the convention as a part of our report, as follows:

TESTS OF COMBUSTION OF COAL IN LOCOMOTIVE FIRE-BOXES.

* * * * * * *

[Only a small part of Mr. Higginson's paper is copied here.]

"For the last year we have been equipping all our engines with the full compliment of hollow stays and the brick arch. When upon the road they rarely show any black smoke for more than 30 seconds after firing, and by care in firing and the use of the blower when steam is shut off, even that can be avoided.

"A comparison of some twenty engines, both passenger and freight, showed a gain of about 10 per cent. for the year 1877 as compared with the years 1876 and 1874. In 1875 we had no detailed reports. In every case by the use of the brick deflector and hollow stays, the steaming power is increased and amount of smoke diminished.

"We find a perceptible difference in wear of netting and stacks when the arch and air jets are used. The average cut out is only half the number that we have with the plain box.

"Some of our engines have made for the year 1877 an average of 2.5 lbs. coal per loaded car per mile with Illinois coals.

"In this connection would notice that on some roads the hollow stays are put in near the top of the box, where they are of comparatively little use, the run to the tubes being very short."

* * * * * * *

Respectfully submitted.

R. WELLS,
Master Mechanic, Jeffersonville, Madison & Indianapolis Railroad.

S. J. HAYES,
Superintendent of Machinery, Illinois Central Railroad,
JACOB JOHANN,
Master Mechanic, Wabash Railroad,
Committee.

Kansas City Union Depot.

We give with this number an elevation, plan and cross sections of the Kansas City Union Depot, which has recently been completed for the use of the roads which centre at that place. The general design and appearance of the main building are shown very well by the front elevation, fig. 1, and its arrangement and the location of the tracks by the plan, fig. 2. From the latter it will be seen that the general plan of the depot is that of a main building for waiting rooms, hotel, offices, etc., with iron arcades or sheds for covering the tracks, instead of an immense and costly building to cover them with a single span. The main building fronts on Union avenue, and has a covered platform in front and rear. The space in the rear of the building is traversed by six railroad tracks connecting with all the railroads entering the city. These tracks are arranged by placing two of them sufficiently far apart to allow trains to pass each other, then leaving a space twenty feet wide, then two more tracks. A "spur" track is also placed at each end of the building. The space between the tracks and also between the rails has been floored with plank three inches in thickness, thus forming a platform 1,000 feet in length, and when completed 90 feet wide. In the spaces between the tracks iron sheds 18 feet high in the centre and 15 feet in width have been erected. These sheds are represented in cross section by fig. 3. They are supported on iron columns placed in line at distances of 15 feet and firmly bolted to stone foundations. The frame work is of angle iron, and the roof of corrugated sheet iron. These longitudinal sheds are connected with each other and with the main building by two transverse "arcades," one at the centre of the main building and the other at the end, as shown in the plan, fig. 2. Fig. 4 is a cross section of these arcades.

Of this general plan Mr. O. B. Gunn, the engineer and superintendent of construction of this work, writes:

"The arrangement of iron arcades or sheds we find very convenient and inexpensive compared with a heavy trussed shed over all the tracks, for the same width and length. These heavy, covered depots into which the cars run are very smoky, very dirty and very noisy, especially when steam escapes and engines run or stand in them. By the arrangement of light sheds we have more light and less noise, while the smoke passes away freely and the cost is small comparatively. Our light sheds have single posts, which gives much better room between the trains than with the usual double posts. The light arcades are parallel with the tracks and protect the passengers while reaching and entering the cars, while the heavy sheds cover all the tracks at right angles to the main building, opposite the main entrance and again at the baggage end of depot. The only objection to this arrangement is that in heavy storms passengers will be subject to a slight dripping from the cars when getting into and out of them.

"All the arrangements of tracks, sheds and the rooms in the main building seem so give great satisfaction to everyone connected with them and to all railroad men."

The following description of the building is copied from the Kansas City *Journal of Commerce:*

"The building fronts toward the northwest and is 384 feet long, with an average depth of 50 ft. It presents the general appearance of a main building two stories in height, connected by walls one story in height, with wings, also two stories high, the whole surmounted by mansard roofs with flat tops. The main building and wings are 75 ft. in height, and from the front centre of the main building a tower 20 ft. square is carried up continuous with the front wall to a height of 84 ft. and is surmounted by a cupola, the top of which is 125 ft. from the ground. The walls are of brick, laid in black mortar, 20 in. in thickness, and rest on solid masonry 15 ft. deep, and laid in the best Fort Scott cement. Eight transverse walls, at various distances, are carried across the building from side to side, and upon these and a line of iron columns resting on stone foundations, and running lengthwise through the centre of the entire building, the upper floors are supported. The wall trimmings are of cut stone, and the cornices, dormer window fronts, etc., are of zinc, painted in imitation of stone. The mansard roofs are laid in colors, and are relieved by gothic gables and French dormer windows, which present the appearance of pilasters rising from the cornice of the building and supporting a four-sided roof covered with slate and surmounted by a cap of the same shape and cornice of the same style as those surmounting the mansard roof. The roof of the main building contains twelve of these dormer windows and each of the wings eight. The 'cresting' which crowns the dormer windows, roof and tower, is of modern design, and consists of a light iron railing worked in fancy designs, and in general effect gives an appearance of lightness to the entire structure. The dome, or cupola of the central tower is also of modern design; starting on a square base and finishing with an octagon. It is covered with tin, upon which are placed vertical ribs of the same material, and is ornamented with 'clock dormers' on each side. Provision has been made for placing a clock in the cupola with outside dials four feet in diameter.

"At the east end of the building ample space has been provided for the use of the 'bus company, and in front, between the platform and the street, is a macadamized carriage drive 20 ft. in width. The waiting rooms for passengers are entered directly from the front platform, and there are also two open passages from the front to the rear of the building, one 8 ft. wide and the other, which is the main entrance, is 16 ft. wide, floored with marble tiles, and opens in the rear under an arcade 32 ft. in height at the centre, 50 ft. wide and extending 78 ft. across the rear platform. The space under this arcade is intended as a passage-way to and from the trains, which will stand on either side. A similar arcade is to be erected across the rear platform at the east end.

"The baggage department occupies the room at the east end of the building. This room is provided with three large sliding doors, and 47 ft. square, and is fitted up with every possible convenience for the prompt transaction of the business of its department. A platform 6 ft. below the ceiling passes around two sides of the room, and on the walls above this platform are ranged hooks by the hundred, whereon to arrange in systematic order the 30,000 to 40,000 checks which are constantly kept on hand. Four check-stands on the floor will accommodate 1,000 different forms of checks.

"The clerk's desk is on an elevated platform reached by a stairway, and here a record will be kept of every piece of baggage received and forwarded.

"Next to the baggage-room are the waiting-rooms for passengers. The ceiling of these rooms is 19 ft. from the floor. The floors and wainscoting are of alternate strips of oiled black walnut and ash, 3 in. in width, the other wood-work being richly grained in imitation of oak. The seats are a framework of oiled black walnut with bent ash seat and back. The ladies' room adjoins the baggage-room, and is 53 × 43 ft. in size, and is provided with tastefully fitted dressing-rooms. Brussels carpets cover the floors, and marble wash-stands, mirrors and elegant seats adorn the rooms. The gentlemen's room is 40½ × 47 ft. and between these two rooms is placed the ticket office, supplied with the latest improved ticket cases and all other appliances necessary for the convenience of the ticket agent and his assistants. Including the 'local tickets,' about 6,000 different forms of tickets are issued from this office.

"Crossing the main hall, which adjoins the waiting rooms, the dining room (47 ft. long and 40⅓ ft. wide) is reached, finished in the same manner as the waiting rooms, and provided with the same style of furniture. The dining room will seat 100 guests, and the tables will at all times be supplied with the best the market affords. No liquors will be sold on the premises. The telegraph office is next, and is connected by a bewildering array of wires with all the telegraph lines entering the city. In one corner of this room a stone pedestal rises a few inches above the floor, resting on a foundation which is entirely disconnected from the building. This pedestal is occupied by the depot clock.

"The general plans for the depot, iron sheds and tracks were designed by Major O. B. Gunn, who has had general charge of the work as engineer and superintendent of construction, with Mr. Wm. E. Taylor as assistant. The work of grading, ballasting, track laying and building platforms was under the immediate supervision of Mr. G. M. Walker, assistant engineer. The general plans were elaborated in detail by the firm of Cross & Taylor, architects, of this city."

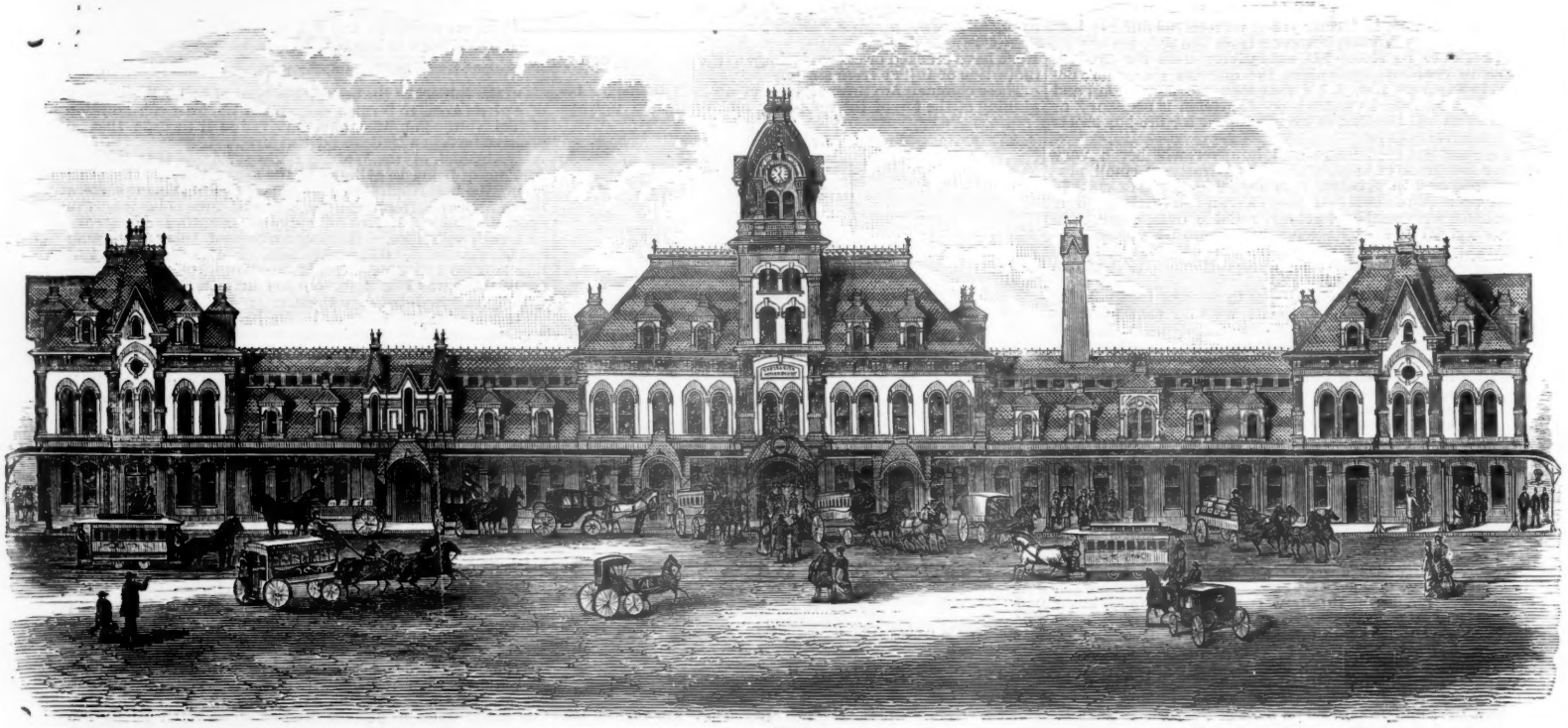


Fig. 1.

KANSAS CITY UNION DEPOT.

The Westinghouse Brake at Paris.

The trains which carry city passengers to the exhibition grounds in Paris are those of the Western Company, which has adopted the Westinghouse brake and has it in operation on the exhibition trains, thus making the most effective display of the brake possible to visitors. Complaints have been made that the enginemen do not use the brake skillfully, but often bring the train from full speed down to a full stop so quickly that the passengers are shocked. The Smith vaccuum brake is also well shown to a large proportion of the visitors, as it is in use on the Northern Railroad, which carries most of the passengers from Great Britain to Paris.

Master Car Builders' Association—Report of the Twelfth Annual Convention.

The convention was called to order at the Continental Hotel, Niagara Falls, per announcement on Wednesday, June 12, at 10 o'clock. The President, Mr. Leander Garey, of the New York Central & Hudson River Railroad, made the following address:

THE PRESIDENT'S ADDRESS.

By permission of Divine Providence we have assembled together this morning for the purpose of a mutual interchange of experience, to receive the reports of committees on subjects proposed one year ago, and to discuss such questions as may be presented by the master car-builders through the country.

During the past year it has pleased our Heavenly Father

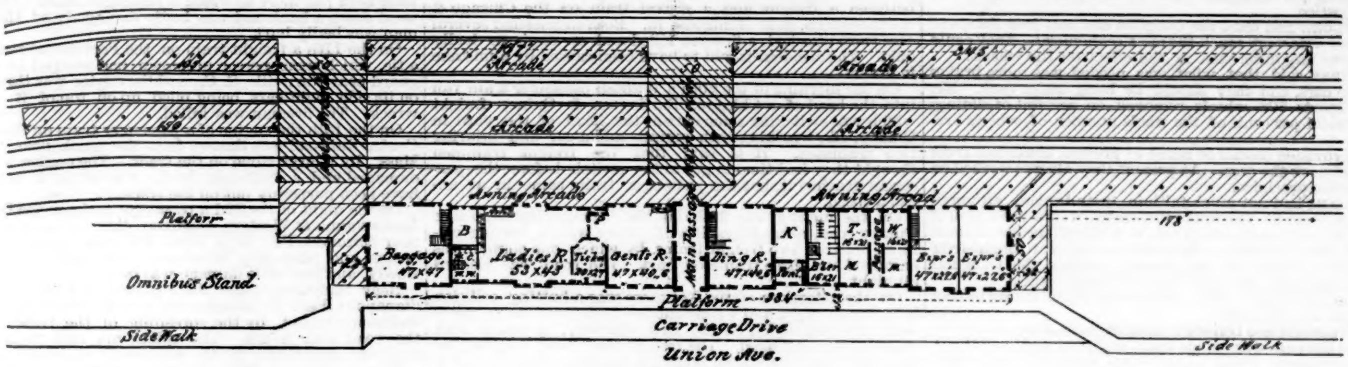


Fig. 2.

to remove by death an active and honored member of the Association, Mr. George Rowe, a resident of this place and my associate on the Committee of Arrangements for this meeting. An efficient and progressive master car-builder has been stricken down in the prime of life. I will request that a committee be appointed to present fitting resolutions commemorative of the high esteem in which our late brother was held by the members of the Association.

Our committee appointed at the last annual meeting to present subjects for consideration as this time recommended that more than the usual time be devoted to receiving and discussing questions that may be presented and less to lengthy reports. Acting upon such recommendations no circulars of inquiry have been distributed by committees during the past year, and, judging from the number of questions already in the hands of our Secretary, the movement is in the right direction.

Some action should be taken early in this session to extend the time mentioned by special rule, in which questions can be received and discussed.

During the fall of 1864, and the winter and spring of

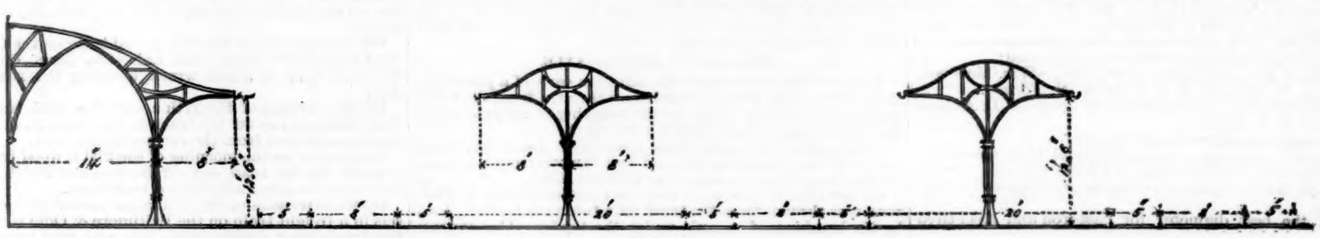


Fig. 3.

1865, may be stated as the time at which the interchange of cars to prevent transferring their loads at termini was, to any extent, practised in this country.

One of the results of this interchange was to transfer, to a considerable extent, the repairs of cars from the shops of their owners to the shops of other companies. This promiscuous distribution of cars for repairs fully demonstrated that the originality or inventive genius of the American people was unlimited, as it was found that the number of sizes and variety of patterns used in the construction of cars by the various companies were legion.

Master car-builders were first to realize the situation, and call for some rule to govern them in making repairs to foreign cars. Several meetings were held by master car-builders previous to the organization of the Association. In these *pioneer* meetings, *uniformity* in those parts of freight cars requiring the most frequent renewals was the important subject considered, and the necessity for uniformity in car construction has been talked and written about up to the present time, and will continue to be discussed by railroad men and the press until the desired result shall be obtained. At a meeting of the presidents and general managers of all the railroads interested in this interchange of traffic, held in the city of Buffalo, in November, 1866, a set of general rules was adopted for the guidance of master car-builders. This meeting, held almost twelve years ago, is the only meeting of executive officers of railroads in this country at which any action has been taken with reference to repairs of cars offered for interchange.

The progress made during the past 14 years toward uniformity in the construction of freight cars has been very small—much less than may be expected within the next five years, as competition and depression in the general business of the country have compelled railroads to move freight long distances at very low rates, which calls imperatively for a reduction in the cost of maintaining freight cars. If an accurate account could be made up of the cost of patterns and materials held by all railroads in the country for repairing foreign cars, it would so impress the managers of our railroads of the necessity for immediate action that they could not resist the call.

This want of uniformity is not only a serious drain upon the earnings of railroads through car repairs, but it holds hundreds, and probably thousands, of cars out of service at a time when they are most needed; it causes delay in the movement of freight, and no end of expense in transferring the same from car to car. Why are railroads drifting along year after year, increasing the rolling stock with so little progress toward uniformity in construction? Is it not the duty of master car-builders to present this matter to their superior officers in the most clear and concise manner possible? I present the subject for your careful consideration.

I would call your attention to the necessity for a careful revision of the rules governing the condition of and repairs to cars employed in through traffic. I will ask for a special session at three o'clock this afternoon, to consider the present rules, copies of which can be obtained of the Secretary at the close of this session.

Gentlemen, thanking you for many acts of kindness in the past, and happy to see so many present, and wishing you all the pleasure and improvement which this our twelfth reunion promises, I now invite you to enter upon the business of the convention.

The usual order of routine business was transacted. The Treasurer's report showed a balance of 80 cents in the treasury of the Association and $224.27 to the credit of the account of the Car-Builders' Rooms in New York.

Mr. Garey moved the following resolution, which was adopted: That the rule on page 162 be amended to read as follows: As much time of each session shall be devoted to receiving and discussing questions from any member as the merits of the questions demand, or the majority of the members present shall decide; such questions to be written on slips of paper and handed to the President and by him repeated to the convention.

The report on Train Brakes was then read.

REPORT ON TRAIN BRAKES.

Your committee continued from last year to report on train brakes for freight cars propose to make a very brief report and leave to the members present the discussion of this important subject, trusting that they will give the convention the benefit of their experience with any tests or experiments they have made, and thereby contribute toward the solution of this problem. Your committee have not had the privilege of examining any new device and have witnessed only one trial of train brakes during the past year, which made very good stops. The proprietor said it could be applied to freight cars for $25 per car, but it requires hose couplings between the cars, which in our opinion is an objection (unless *all* the cars running over any road could be equipped at once), and even then the liability of the hose being lost while the cars run off on other roads that did *not* use the brake would remain.

We have no doubt that the stringency of the times, together with the liability of poor returns, have a discouraging influence upon inventors, but your committee are not of that number who believe that the thing is impossible of achievement, although we still adhere to our previously expressed opinion, that in order to meet all the requirements, an automatic brake should be so constructed as to be applicable and operative on one or more cars in a train, without any other connection with the engine than the ordinary coupling between the cars, and every locomotive and tender should be provided with a steam brake always ready for application.

In conclusion, your committee would say they are informed that there will be several cars in this place equipped with train brakes which use the momentum of the trains to stop them, that have been in successful operation for several months, and the members of this Association

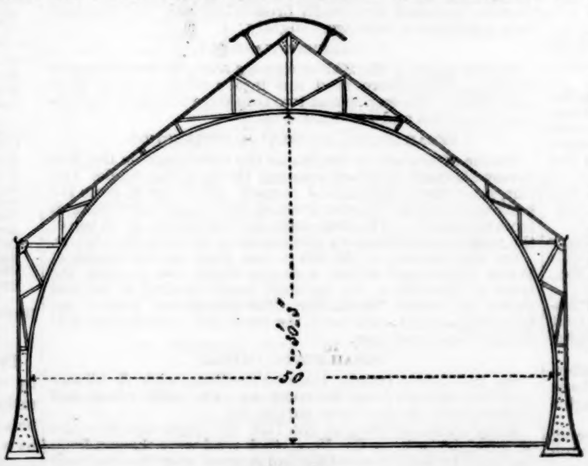


Fig. 4.

are invited to examine the same and witness its operation.

All of which is respectfully submitted,

C. E. Garey, }
Geo. Hackett, } Committee.

DISCUSSION ON TRAIN BRAKES.

Mr. Kirby, of the Lake Shore & Michigan Southern, said that he had seen the working of the brake, and that the conductor handled the train without difficulty.

Mr. Ford, of the Little Miami, asked whether there was not the same difficulty with this as with other brakes.

Mr. Ford said there was not.

Mr. Garey thought that a freight-train brake was needed, but he did not see how one could be adopted at present. A train could be run at less cost of repairs at 25 than at 8 miles per hour. The trouble is in stopping them when running at the highest speeds. The ordinary number of brakemen could not stop a train in much less than a mile and a quarter. The brake of Mr. Fields would probably answer on short trains, but the friction on one pair of wheels might cause them to slip.

Mr. Richardson, of the Boston & Maine, thought there was very little danger of sliding the wheels. He had examined the wheels recently, and there was no indication that they had been slid.

Mr. Coulter, of the Ohio & Mississippi, said that on his road a chain brake was tried on a passenger train. The difficulty was that it would not work satisfactorily on the rear car.

Mr. Kirby said a combination of wrought and cast iron for brake blocks had been found to have superior advantages.

Mr. Ortton asked why the compound shoe was best, and whether Mr. Kirby had had any experimental knowledge of it.

Mr. Kirby said the wrought iron would glaze over and the cast iron would wear away rapidly. The combination of the two prevents the glazing of the one and the rapid wear of the other.

Mr. Wiers, of the Atlantic & Great Western, had applied a number of the combination shoes. Four of them wore out 18 cast-iron shoes, and the four were still running.

Mr. Wright had the same experience as Mr. Wiers.

Mr. Wiers, in reply to a question, said that the combination shoe weighed 23 lbs.

Mr. C. E. Garey, of the New York & Harlem, said that there was much in the brake-shoe question that relates to train-brakes. He gave a report of two tests in which the Congdon (combination) brake-shoes wore out several times their weight of cast-iron shoes.

Another member who had had some experience in the use of combination shoes found that they would wear out four cast-iron shoes.

Mr. Hemphill, of the Toledo, Peoria & Warsaw, had fitted up one truck with the Congdon shoe and the other with cast-iron shoes. The former wore out three sets of cast-iron shoes.

Mr. Kirby did not condemn the cast-iron shoe. He had not heard anything about the effect on the wheels. The cast-iron does not hold as well as the combination shoe does, because it wears so rapidly.

Mr. Richardson inquired whether more wheels were not spoiled by cast-iron than by wrought-iron shoes.

Messrs. Kirby and Allen could see no difference. The latter gentleman said that the effect of the wrought-iron was to chill the cast-iron.

Mr. Hopkins asked whether Mr. Garey observed any difference in the wear of the wheels with the different shoes.

Mr. Garey could see no difference.

Mr. Kirby said that for fear that it might appear that he was advertising the Congdon shoe, he would say that one malleable shoe would wear out about 2½ cast-iron shoes.

Mr. Ortton, of the Canada Southern, said that it was not a question of the wear but of the effectiveness, which will enable you to pull up effectively, which kind of brake-shoes does this the best. He thought that steel would wear longer than any other material.

Mr. Garey said a brakeman reported that cast-iron blocks would not stop a train as quickly as wrought-iron. He has had a report of the working of amalgamated brake-shoes.

Mr. Martin said the slipping of the wheels should be considered. The cast-iron shoes caused the wheels to slip sooner than a wrought-iron shoe.

Mr. Forney, of the *Railroad Gazette*, asked if wrought-iron shoes do not hold as well as cast-iron ones.

Mr. Ortton wanted to know the same thing.

Mr. Ford said it was important that the brakes should hold, but the question of economy was also important. They could get the power by giving more leverage.

Mr. Hopkins said that when a brakeman applies the brake a small cloud of dust, consisting of small particles of iron was produced. This was not the case with the combined shoe, but the particles of cast-iron became wedged in between the fibres of the wrought-iron, and in this way it

holds better than either alone. He thought that wrought-iron would wear out the wheels the most.

Mr. HACKETT, of the Central of New Jersey, said his road was using steel shoes and cast-iron. The former slides the most.

Mr. FORNEY said that analogy was not a safe guide.

Mr. WILDER, of the Erie, thought that the glazing did not have a bad effect. His road used both the wrought and cast-iron.

Mr. SNOW, of the Illinois Central, said that the glazing does not occur on a wrought-iron shoe. He had tried it with a file, and they had no difficulty in holding their trains. Their inspector had said that one wrought-iron shoe would wear out four Congdon shoes.

Mr. C. E. GAREY asked whether the cast-iron of the wheel did not abrade and mix up with the wrought-iron as is claimed for the Congdon shoe.

Mr. HOPKINS could not form a theory that would do the subject justice.

Mr. MOORE had tried the Congdon and cast-iron shoe, and the former was very much the most economical. They could not observe any difference in the effect on the wheels.

Mr. KIRBY said that what was needed was more brakes under the cars, and they should be hung under each. Mr. Adams reports 506 wheels removed on account of sliding; which was 24 per cent. of the whole number of wheels removed.

Some provision should be made to prevent brakemen from falling between the cars. At present they always worked on the edge of a precipice.

Mr. ADAMS had not much faith in train brakes, although his President had. The brake illustrated would work well if all the cars were made alike, but in a miscellaneous train it was quite impracticable. He could not use a wrought-iron shoe on steel tires. He had mostly applied the Congdon shoes to steel tires, but could not yet report results.

Mr. FORD said that if Mr. Adams was right, it was useless to continue the discussion.

Mr. ADAMS did not believe a freight-train brake could be used until the cars were made more uniform, and he did not think car-builders would agree about anything; and until they did it was impossible to have a train brake.

Mr. C. E. GAREY said the impression seemed to exist that there must be some connection of the brakes between the cars. If that was so, then he thought a train brake must be abandoned.

Mr. HOPKINS believed that freight trains must run faster, and therefore a freight-train brake would be needed.

Mr. ADAMS doubted whether it would pay to apply brakes to both trucks, because the cost of maintenance would be greater than the loss due to sliding wheels.

Another member had had difficulty from the sliding of wheels when he used brakes on only one truck. He had now applied them to both trucks.

Mr. KIRBY advocated the use of brakes on all the trucks of freight trains.

Mr. ORTTON objected to the idea that a train could be stopped as soon with brakes applied to four as if applied to eight wheels. He also thought that uniformity of running and draw gear would be brought about.

Mr. MOORE favored the use of brakes on all the wheels, and of encouraging the introduction of freight-train brakes.

Mr. FORNEY asked whether a railroad company would make money by applying brakes to all the wheels of freight trains.

Mr HOPKINS observed that on the Erie road they could run a freight train at 25 or 30 miles per hour with less consumption of fuel than at the regular freight-train speed.

The following committees were then appointed:

On Subjects for Discussion Next Year.—Wm. McWood, John Kirby, W. Holmes, M. P. Ford, M. N. Forney.

To Nominate Officers for the Ensuing Year.—F. D. Adams, W. B. Snow, E. R. Brown.

The meeting then adjourned to 3 p. m.

We add from proceedings which followed those heretofore reported that the old officers were all reëlected, and the following subjects selected for investigation and report by committees:

1st.—On the best diameter for cast-iron and steel-tired wheels.

2d.—To recommend a form and the dimensions for a standard draw-bar and draw-springs and the best method of bringing about uniformity in their length and construction.

3d.—To investigate and report whether it is desirable and economical to apply brakes to all the wheels of freight cars, and the best way of bringing about uniformity in their construction, and to recommend forms and proportions for standards for those parts of brakes which require most frequent renewal.

4th.—To investigate the causes of accident to trainmen and report what means can be provided to protect them and yard men from injury while engaged in the performance of their duties, and that the Yard Masters' Association be invited to communicate with this committee.

5th.—To investigate and report on the present construction of screws and nuts used on cars and the amount of accuracy that it is desirable to secure, and the best means of maintaining it in the standard adopted by this Association some years ago.

Train Accidents in May.

The following accidents are included in our record for the month of May:

REAR COLLISIONS.

On the morning of the 12th as a shifting engine on the Pennsylvania Railroad was backing into the depot at Jersey City, N. J., the reverse lever caught fast in some way, and before the engine could be stopped it ran into a passenger train, wrecking one car. The engine itself was damaged and a fireman hurt.

On the 13th a freight train on the Erie Railway ran into the rear of a preceding freight near Linden, N. Y., wrecking the caboose and damaging the engine.

On the afternoon of the 13th a Grand Trunk passenger train ran over a misplaced switch and into the rear of a Portland & Rochester passenger train, in Portland, Me., damaging one car.

On the morning of the 17th a passenger train on the Pittsburgh & Castle Shannon road ran into the rear of a coal train on a curve near Fair Haven, Pa., wrecking the engine and injuring the engineer.

On the night of the 27th a passenger train on the Intercolonial Railway ran into some cars which had broken loose from a preceding coal train near Debert, N. S. The engine and several coal cars were badly damaged.

On the evening of the 29th a freight car which was being run upon a siding on the Pittsburgh, Virginia & Charleston road in South Pittsburgh, Pa., ran into another car and was wrecked, injuring a brakeman.

BUTTING COLLISIONS.

On the 7th a coal train on the North Pennsylvania road broke in two near Gwynedd, Pa., and the detached cars ran back down the grade at a high speed and into the head of a following coal train, damaging the engine, wrecking two cars and blocking the road four hours.

On the night of the 9th a west-bound freight train on the Chicago, Burlington & Quincy road ran into an east-bound freight which was backing upon a siding at Bristol, Ill. The engine and several cars were badly damaged.

Early on the morning of the 16th near Mexico, Mo., on the St. Louis, Kansas City & Northern road, there was a butting collision between two freight trains. Immediately after the engines struck one of the boilers exploded, tearing the engine to pieces and scattering the wreck for a great distance. The other engine and 14 cars were badly broken, two trainmen and a tramp hurt. The accident is said to have been caused by a mistake in reading an order.

On the afternoon of the 17th there was a butting collision between a freight train and a yard engine on the Pittsburgh, Fort Wayne & Chicago track in Chicago, Ill., by which both engines were badly damaged, and one man was hurt. It is said that the freight train was signalled, but failed to stop.

On the afternoon of the 18th there was a butting collision between a freight and a gravel train on the Chicago & Northwestern, near Moingona, Ia. Both engines and several cars were wrecked, a fireman killed and an engineer badly hurt. The accident is said to have been caused by a mistake in orders.

On the morning of the 20th a Wabash passenger train ran into the head of a Chicago, Burlington & Quincy freight which was switching some cars at the head of the yard in Quincy, Ill., wrecking both engines and a car and injuring two trainmen. It is said that the freight trainmen thought they had time to get to the switch before the passenger reached it, but the passenger train came in at unusual speed.

On the night of the 20th, on the Chicago, Burlington & Quincy road, near Biggsville, Ill., there was a butting collision between two freight trains, by which one engine was damaged and three trainmen hurt. The road was blocked all night.

On the afternoon of the 22d there was a butting collision between a freight and a construction train on a sharp curve near Otisville, N. Y., on the Erie Railway, by which both engines were damaged. The freight had been flagged, but the other train was nearer than the flagman thought, and it could not be stopped in time.

On the 23d there was a butting collision between a construction train and a wild engine on the Indianapolis & St. Louis road, near Bethalto, Ill. Both engines were badly damaged and the road blocked three hours.

On the 30th a north-bound freight train on the Dayton & Michigan road ran into the head of a south-bound freight, which was standing on the track at Swander's, O., wrecking both engines and seven cars and killing the engineer of the north-bound train. The two trains had orders to pass at that point, but the north-bound train came up so fast that it could not be stopped in time.

UNEXPLAINED COLLISION.

On the morning of the 24th there was a collision between two freight trains on the Pennsylvania Railroad, at Lawrenceville, Pa., by which three cars were thrown over and damaged.

DERAILMENTS, BROKEN RAIL.

On the morning of the 27th several cars of a freight train on the Wabash road were thrown from the track by the breaking of a guard rail in the yard at Lafayette, Ind., and one was badly wrecked.

Late on the night of the 31st a passenger train on the Louisville & Nashville road struck a broken rail near Nolin, Ky., and two cars were thrown over upon a bank and damaged, injuring five passengers slightly.

DERAILMENTS, BROKEN AXLE.

Early on the morning of the 4th four cars of a passenger train on the Union Pacific road were thrown from the track near Rock Springs, Utah, by the breaking of an axle under the express car. The conductor was hurt.

On the aftornoon of the 19th a car in an excursion train on the Western & Atlantic road was thrown from the track by the breaking of an axle near Calhoun, Ga.

On the 11th a passenger train on the Chesapeake & Ohio road was thrown from the track on a bridge at Goshen, Va., by the breaking of an axle under the tender. One express car was forced through one truss of the bridge, wrecking it badly, and the second was thrown from its trucks across the track.

DERAILMENTS, BROKEN BRIDGE.

On the 7th a trestle bridge on the Atlantic, Gulf & West India Transit road, near Waldo, Fla., gave way under a freight train, and six cars went down and were badly wrecked.

On the morning of the 11th a bridge on the Chicago, Rock Island & Pacific road, near Atlantic, Ia., gave way under a freight train and nine loaded cars went down into the water.

On the night of the 21st a freight train on the Kansas Pacific road went through a bridge over the Kiowa River near Denver, Col., the supports of which had been washed out by a freshet. The engine went down into the river with a number of cars on top of it, killing the engineer, fireman and a brakeman.

DERAILMENT, SPREADING OF RAILS.

Early on the morning of the 27th two cars of a passenger train on the Wabash road were thrown from the track near Boody, Ill., by the spreading of the rails. The cars went down a bank and were badly broken, injuring two trainmen badly and seven passengers slightly.

DERAILMENT, WASH-OUT.

On the night of the 23d an express train on the Chicago & Michigan Lake Shore road ran into a wash-out near Manlius, Mich. The engine and two cars were wrecked, and one car caught fire and was burned up.

DERAILMENTS, ACCIDENTAL OBSTRUCTION.

On the afternoon of the 5th as the milk train on the New Jersey Midland road was running through the Snake Den Cut, near Ogdensburg, N. J., a rock rolled down from the bank and struck the rear truck of the tender, throwing it from the track. The first milk car was driven up on top of the tender, wrecking both and blocking the road three hours.

On the evening of the 6th a coal train on the Seattle & Walla Walla road struck a wagon which was crossing the track at the foot of the inclined trestle leading to the coal shutes at Seattle, Wash. Ter. The wagon was broken up, throwing several cars from the track and a brakeman was thrown down and hurt.

DERAILMENTS, CATTLE.

On the 10th a freight train on the Brunswick & Albany road was thrown from the track by some cattle which had strayed upon the road near Satilla, Ga.

Early on the morning of the 11th the engine and five cars of a freight train on the Naugatuck road were thrown from the track by some cows which had strayed upon the road near Derby, Conn., blocking the road several hours.

On the night of the 46th a freight train on the New York Central & Hudson River ran over a horse near Jordan, N. Y. The engine and 10 cars were thrown from the track and a brakeman killed.

On the afternoon of the 21st a passenger train on the Cincinnati, Sandusky & Cleveland road ran over a cow near West Liberty, O., and the whole train left the track. The engine and two cars were much damaged and three persons hurt.

On the evening of the 30th a passenger train on the Macon & Brunswick road ran over some cows near Brunswick, Ga., and the whole train was thrown from the track, blocking the road all night.

DERAILMENTS WITH MALICIOUS INTENT.

On the afternoon of the 9th a freight train on the Grand Trunk road struck a tie and rail, which had been placed across the track at Ste. Julie, P. Q. The engine was thrown over and badly broken and seven cars were piled up on top of it in a bad wreck. The engineman was slightly hurt. Another train had passed the place half an hour before, when the track was clear.

On the evening of the 10th the engine of a freight train on the Erie Railway was thrown from the track near Port Jervis, N. Y., by obstructions upon the track, believed to have been put there to wreck a passenger train. The engine went down a bank and was badly damaged and the engineman was badly hurt.

On the 11th a freight train on the Port Royal road struck a tie, which some person unknown had wedged in a cattle-guard near Varnville, S. C., and the engine was thrown over on its side, eight cars being piled up on top of it in a bad wreck. The fireman was killed.

On the 15th the engine of a passenger train on the Grafton Centre Railroad was thrown from the track near Grafton, Mass., by a large stone on the track. The engine was badly damaged and a trainman hurt. The stone is believed to have been purposely put on the track.

On the night of the 22d a passenger train on the Delaware, Lackawanna & Western road was thrown from the track near Scranton, Pa., at a point where a switch had been broken and purposely misplaced. The train was running slowly, and but little damage was done.

Near midnight on the 23d a passenger train on the Indianapolis, Peru & Chicago road was thrown off the track in Indianapolis, Ind., by the spreading of the rails, blocking the road four hours. The spikes are said to have been removed, apparently for the purpose of wrecking the train.

Near noon on the 26th a passenger train on the City Park & Lake road was thrown from the track by the spreading of the rails near Lake End, La. The engine and two cars upset, injuring six persons. It was found that the spikes had been drawn from several rails by some persons unknown.

Late on the night of the 29th as a ballast train on the Prospect Park & Coney Island road was running backward in Brooklyn, N. Y., it struck some stones, which some person unknown had wedged in between the rails and the planking at a road crossing. The four cars of the train were thrown off and upset, the conductor and four laborers killed, one other laborer badly and four slightly hurt.

DERAILMENTS, UNEXPLAINED AND MISCELLANEOUS.

On the morning of the 9th a passenger train on the Wabash road ran off the track near Kinderhook, Ill. The engine upset, and three cars went down a bank.

On the night of the 11th, as an engine on the New York & New England road was switching some freight cars into the freight house at Willimantic, Conn., it failed to stop in time, and some of the cars went off the track and through the end of the house, doing some damage.

On the afternoon of the 13th the engine and tender of a construction train on the Olean, Bradford & Warren road ran off the track at Cutting's Mill, Pa., injuring the engineer badly.

On the morning of the 17th a coal train on the Old Colony road ran off the track near Lakeville, Mass., and 31 cars were piled up in a bad wreck, blocking the road a whole day.

On the evening of the 17th a car of a coal train on the Erie Railway ran off the track in Paterson, N. J. A brakeman was thrown from the car and badly hurt.

Very early on the morning of the 22d a wood train on the Central Pacific road ran off the track at Dutch Flat, Cal., wrecking six cars and killing a brakeman.

On the afternoon of the 26th a car loaded with oil in barrels in a freight train on the Baltimore & Ohio road jumped the track near Cook's Mills, Md., and was wrecked. The oil caught fire and burned up the wrecked car and four others, with 250 barrels of oil. The track was completely destroyed for 100 yards.

OTHER ACCIDENT.

On the evening of the 23d as a passenger train on the Erie Railway was near Mahwah, N. J., an eccentric strap broke and the broken end was whirled around against the bottom of the boiler, tearing a hole in it and letting out the steam and water.

This is a total of 50 accidents, whereby 13 persons were killed and 44 hurt. Seven accidents caused the death of one or more persons; 16 caused injury but not death, while in 27, or 54 per cent. of the whole number, there was no injury serious enough for record.

As compared with May, 1877, there is an increase of four accidents, of one in the number killed, and of three in that injured. As far as numbers are concerned the two months were very nearly alike.

The accidents for the month may be classified according to their nature and causes as follows:

COLLISIONS:		
Rear collisions	6	
Butting collisions	10	
Unexplained	1	
		— 17
DERAILMENTS:		
Unexplained	6	
Broken rail	2	
Broken axle	3	
Broken bridge	3	
Spreading of rails	3	
Wash-out	1	
Accidental obstruction	2	
Cattle on track	5	
Malicious obstruction	5	
Misplaced switch	1	
Running off end of siding	1	
		— 32
Broken eccentric strap		1
Total		50

Two accidents were caused by trains breaking in two; two by mistakes in orders; one each by a broken engine, by a misplaced switch, by a flying switch, by failure to use signals and by careless running. In the only derailment caused by a misplaced switch, it was purposely set wrong, and two cases of spreading of rails are reported as caused by malicious removal of the spikes. Of the broken bridges one had its abutments washed out by a freshet, one was a wooden trestle, and of the third we have no particulars. There were 13 accidents traced directly to defects or failures of road or equipment.

Of the collisions one was between passenger trains, four

between passenger and freight and 12 between freight trains; 13 derailments were of passenger and 19 of freight trains, and the only other accident was to a passenger train. The 17 collisions killed two persons and injured 10, while the 32 derailments killed 11 and injured 44. Persons were killed or hurt in eight out of 17 collisions, and in 15 out of 32 collisions.

The first thing to attract attention is the unusual proportion of butting collisions. Usually the rear collisions are the most numerous, but this month they fall much behind. Butting collisions, perhaps more than any other kind of accident, indicate bad handling of trains, and their unusual number is not at all a good sign. Another unpleasant feature is the large number of malicious derailments. Five of these were caused by obstructions put upon the track, one by a misplaced switch and two by the removal of spikes; causing the rails to spread when the train struck them. This last is a peculiarly dangerous method, as it is impossible for the engineer to see that anything is wrong as long as the rail is not removed from its place, and in a secluded place spikes can easily be drawn between the time of the track-walker's visit and the passage of a train. One of the accidents caused by a malicious obstruction was the most fatal of the month, killfive persons and injuring five others.

For the year ending with May the record is as follows:

	No. of Accidents.	Killed.	Injured.
June	49	16	92
July	53	21	144
August	98	46	220
September	84	20	88
October	82	31	112
November	83	23	70
December	66	8	26
January	75	23	77
February	67	8	31
March	49	5	14
April	46	12	55
May	50	13	44
Total	802	226	973

The averages per day were, for the month, 1.61 accidents, 0.42 killed and 1.42 injured; for, the year, 2.20 accidents, 0.62 killed and 2.68 injured. The average casualties per accident for the month were 0.260 killed, and 0.880 injured; for the year they were 0.282 killed, and 1.213 injured.

The Union and Kansas Pacific Contract.

The following is given in a telegram from Leavenworth to the Chicago *Tribune* as the text of the recent contract between the Union Pacific ("party of the first part"), the Colorado Central ("party of the second part"), and the Kansas Pacific ("party of the third part"). It is said to be executed in quadruplicates, the three companies and the receivers of the Kansas Pacific being the parties:

It is agreed between the parties as follows:

1. That the railroads of the parties hereto shall, under the general direction of the Union Pacific Railroad Company, be managed, operated and controlled as one property.

2. That, to this end, all the tolls, income, issues and profits arising from the freight, passenger and all other traffic of, over or from the said railroads, including the existing branches of the Kansas Pacific Railroad Company hereafter referred to, as gross earnings of the parties hereto, including the bridge of the party of the first part over the Missouri River, between Omaha, in Nebraska, and Council Bluffs, in Iowa, shall constitute a common fund or pool.

3. That the gross earnings contributed by the parties hereto shall be apportioned, divided and remitted monthly to the proper officers of the respective parties hereto, as follows—*i. e.*, to the party of the first part, for its main line, 72.858 per cent.; to the party of the first part, for its Omaha bridge, 2.776 per cent.; to the party of the second part, 4.673 per cent. These percentages having been arrived at by mutual agreement, the earnings of the properties of the parties hereto, for the preceding year having been treated as the basis of this apportionment, the said earnings for the preceding year having been agreed to have been as follows, viz.:

Of the party of the first part for its main line	$12,873,203
Of the party of the first part for its Omaha bridge	475,273
Of the party of the second part	800,000
Of the party of the third part	3,371,301
Aggregate gross earnings for the preceding year.	$17,119,777

Provided, however, that if the contributions of either of the parties hereto for gross earnings for any month shall be in excess of its distributive share of the gross earnings on the basis of this article, then there shall be retained by such party, out of the aggregate gross earnings the sum of 50 per cent. of such excess on freight earnings, such sums to be allowed to such party as a compensation for the loss of conducting the transportation of freight by it, but not be allowed for the transportation of passengers.

4. That within thirty days after the expiration of the first year after the execution of this agreement, and within thirty days after the expiration of each succeeding year of the period covered by this agreement, a readjustment of the above-named percentages shall be made on the application of either of the parties hereto, if they be not otherwise agreed, in the following manner:

The party of the first part shall nominate two disinterested experts, one of whom shall be charged with the duty of representing and acting in the interest of the Omaha Bridge, the other of whom shall be charged with the duty of representing and acting in the interest of the main line of the party of the first part, and the parties of the second and third parts shall each nominate a disinterested expert, each of whom shall be charged with the duty of representing and acting in the interest of the second and third parts respectively, and if the experts nominated shall unanimously agree upon a decision of the matters and questions submitted for their determination, such decision shall be final for the succeeding year, but if they shall not agree upon a unanimous decision, said experts shall agree upon a fifth expert, and a decision of a majority of said five experts upon the matters and questions submitted shall be final for the succeeding year; and it shall be the duty of such experts, in considering the matters and questions submitted for their determination, and in forming their decision, to give careful and due regard to the natural and legitimate growth of local freight and passenger traffic of the railroads and of the parties hereto; that, in determining the percentages of the respective parties thereto, the railroad of each of the parties hereto shall receive due allowance for the earnings from freight and passenger traffic naturally belonging to said railroads respectively; and it shall also be the duty of such experts to give full force and effect to the spirit and intention of this agreement, which is hereby declared to be to operate the railroads of the parties hereto as one property, and in such manner as to produce and to assure the greatest financial benefits to them as a united interest.

5. That the account of gross receipts of all freight, passenger and other traffic of the railroads of the parties hereto shall be kept by the proper officers thereof, and all of said receipts shall be remitted to the joint treasurer of said companies at Boston, under such rules and regulations as the managers shall direct.

6. That each of the parties hereto, when it can consistently be done without especial difficulty or injury to itself, will, if required, accommodate either of the other parties hereto with materials and supplies used in operating said lines of railroads at the same rates charged to itself, by whom the same may be furnished, and that the rate of transportation of such materials and supplies shall be 1 cent per ton per mile.

7. That this agreement shall continue operative and controlling upon the parties hereto for fifty years from date of its inception, which last-named date shall be within thirty days from the making hereof.

8. That this agreement is subject to the ratification of the United States Circuit Court for the District of Kansas, in the suit of A. Meier *et al. vs.* The Kansas Pacific Railway Company *et al.*

Convention of the American Society of Civil Engineers.

The tenth annual convention of this society assembled in Boston, Tuesday, June 18, at the hall of the Massachusetts Institute of Technology. The following account of the proceedings of the first day we take from the Boston *Post:*

Among those who are now in Boston attending its sessions are G. Clinton Gardner and R. H. Soule of the Pennsylvania Railroad, A. D. Briggs of Springfield, Thomas D. Lovett of Cincinnati, R. Fink of Alexandria, Va., C. C. Martin of the Brooklyn Bridge, John Bogart of New York, W. Milnor Roberts of the Northern Pacific Railroad, Martin Corvell, Secretary of the Society, of Lambertville, N. J., William H. McFadden, of Philadelphia, Charles Darrach and D. McN. Shauffer of Philadelphia, George H. Frost of Chicago, F. Collingwood of New York, D. W. Melvin of Staten Island, R. Hering of Philadelphia, P. Golay of Cincinnati, Arthur Spielman of Jersey City, Arthur Macy of Brooklyn, W. H. Wiley of New York, A. B. Hill of New Haven, Charles Pfeifer of the St. Louis Bridge, E. L. Corthell of New Orleans, Assistant Engineer in the construction of the Mississippi jetties, Charles Latimer of the Atlantic & Great Western Railroad, Gen. Albert of Washington, David E. McComb of Washington, Prof. Devolson Wood of Hoboken, William P. Shinn, General Manager of the Edgar Thomson Steel Works of Pittsburgh, Pa., Frederick W. Clark of Chicago, and J. T. Fanning of Manchester, N. H.

The opening business sitting was called to order at 10 a. m., by Vice-President W. Milnor Roberts, and E. S. Philbrick of Boston was chosen to preside. At the conclusion of the customary routine business, the paper of William H. Burr, "Approximate Determination of Stresses in the Eye-Bar Head," read at a previous meeting, was discussed by Prof. Devolson Wood, and the paper of Charles E. Emery, "Relative quantities of material in bridges of different kinds, of various heights," was discussed by W. H. Searles. A paper entitled "A new method of detecting overstrain in iron and other metals, and its application in the investigation of the causes of accidents to bridges and other constructions," by Robert H. Thurston, was read by the Secretary, Mr. Bogart. A paper on "The South Pass Jetties," descriptive and incidental notes and memoranda, by E. L. Corthell, was read by the author, and models of the jetties shown. This was followed by a paper on the same subject, by Capt. C. W. Howell, U. S. A. Mr. F. Collingwood explained the recent accident to a strand of the wire of the East River bridge, illustrating with drawings on the blackboard, after which the convention adjourned for dinner.

In the afternoon, upon an invitation extended by the Boston Society of Civil Engineers, an excursion was made to the Newton Upper Falls aqueduct bridge of the Boston Water Works. In going to this point a train provided by Manager C. P. Clark, of the New York & New England Railroad, was used. In returning to the city, the visitors and their hosts indulged in a carriage drive through some of the most beautiful of the suburbs. The committee who arranged this affair comprised William H. Bradley, Superintendent of Sewers of the city of Boston; Edward Sawyer, Engineer of the Newton Water Works; George S. Rice, Secretary of the Boston Society; Desmond Fitzgerald, Superintendent Western Division Boston Water Works; C. W. Kettelle, with Clemens Herschell as manager.

Upon reassembling at the hall in the Institute in the evening, the discussion of the work now being done at and near the mouth of the Mississippi River, and other kindred topics, was resumed, E. L. Corthell and Charles W. Howell being among the speakers. The danger arising from crevasses was referred to and described at some length, and in conjunction with this branch of the topic the subject of levee construction was also considered. Following this was a paper by William W. Maclay, entitled "Notes and experiments on the use and testing of Portland cement."

The telegraphic report of the second day's proceedings says that papers were read and discussed as follows: "Notes and Experiments on the Use and Testing of Portland Cement," by William W. Maclay. Discussed by Mr. Collingwood and Mr. Steiner. "Wing Dams in the Mississippi, above the Falls of St. Anthony," by Edward P. North. No discussion. "Brick Arches for Large Sewers," by R. Herring. Discussed by W. M. Roberts, E. S. Chessborough and Mr. Collingwood. "Rainfalls," by James B. Francis. A paper on "The Nomenclature of Building Stones and Stone Masonry," by James J. R. Croes, read at a previous meeting, was discussed by J. Foster Flagg, William E. Merrill and Edgar B. Van Winkle,

Contributions.

The Running Gear of Cars.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I supposed that the example cited in my communication of the 27th ult., in which I compared a horse and wagon to a locomotive and train, was so obvious in its force and application as not to need more than a mere statement; but since, in your last, "A. M. W." confesses his inability "to correctly appreciate" it, I will "rise to explain."

The horse corresponds to the locomotive; the wagon, to the train, including the tender, and the traces and shafts to the coupling between the locomotive and tender.

"A. M. W." now says: "The reaction of the horse's hoofs against the ice and of the horse's body against the shafts supplies a force precisely corresponding to the reaction of the rail against the flange."

Exactly so as to the truck of the locomotive; and if he will take the trouble to refer to my former letter he will there see that the reaction of the rail against the flange is what I employ for deflecting the truck, and this, by its leverage, the drivers and the remainder of the locomotive—the same as the horse is turned; and that this being accomplished, the direction of the traction is what I have principally relied on for deflecting the load in both instances.

The friction that exists between the ice and the wheels, instead of assisting to keep the axles radial, is a hindrance.

The objection that the wagon wheel-base is not rigid, and my example therefore not pertinent, seems to me to be not very well taken, since the same thing would occur, although at a greater expenditure of effort on the part of the horse, if the wheel-base was rigid; or, to make the case stronger, even if there were no wheels at all, as, for instance, if the object drawn was a sled or a block of ice or other substance.

If "A. M. W." will try this in addition to his other experiments, I think he will find that the path described by the load (if it is of sufficient size) will cover the horse's tracks.

He may say of my illustration that if the horse goes fast, enough centrifugal force will be generated to make the wagon slide out of the true curve.

This is very true; but even in this event, if the horse's tracks are in a curve like that traced by the locomotive, the load will approximately follow them, if the traces do not break.

In this case rails and flanged wheels would be of great assistance in keeping the load true and in place, so would radial axles and other devices, but neither of them is *essential* to that deflection.

All I attempted to show was that the reaction of the rail against the flange was not the *only* force which produced the change in direction of the car, and that so far from this being the only force which did or could effect this change, it might be accomplished without calling this into play at all; and, furthermore, that when the locomotive was ahead, it generally was made without as much influence from the reaction of the rail against the flange as "A. M. W." supposed.

C.

June 14, 1878.

Strength of Timber as Affected by Long Saturation.

NEW YORK, June 12, 1878.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Can you cite any authorities which enter into the relative decrease of strength in timber after it has been thoroughly soaked? Your correspondent not only refers to that flexibility developed by wet, but also to the ultimate effect of long immersion, such as is obtained in piles for years kept under water. He has heard it firmly advanced that long saturation destroys, to a great extent, the strength of the wood. He uses the term "strength" as distinguished from "stiffness."

X. X.

Transportation in Congress.

Two important bills were saved in the scramble that marked the close of the session of Congress. On the 19th, the closing day, the House passed the Senate bill providing for an Auditor of Pacific Railroad Accounts, the provisions of which we have already summarized. On the same day the House also passed the Senate bill providing for the establishment of a board of Pacific Railroad Commissioners, in which Charles Francis Adams, Jr., Albert Fink and an engineer officer to be chosen by the President are named as the first Commissioners. This bill we have also summarized.

Notes.

Locomotive engineers are not superstitious men as a class, but there are very few who cannot tell from their experience of an unlucky engine, an engine which was always getting into trouble without any assignable cause. Indeed we have heard of cases where it was not easy to get any one to run a certain engine on account of its unlucky character. On every road, too, there will be found one or more engines which are notorious for the number of men they have killed or hurt. One instance is recalled where two new engines were pronounced unlucky even before they were finished, on account of the names given them, and each one of them killed a man on its first trip over the road.

An Elizabeth street mule kicked a C., B. & Q. baggage master the other day. The baggage master turned, laid his hands on the mule's neck and crupper holder, shouted "Illinois, 23,817!" and the family in the house across the street ran down into the cellar to escape the tornado. The veterinary surgeon told the Elizabeth street man it was no use to have the blacksmith mend the shoes, because the mule could never walk on them legs again. The baggage master walked down to the depot, yawned, stretched himself and said he wished business would pick up, he was getting too fat and lazy for anything.—*Burlington Hawkeye.*

A baggage master at Reno, Nev., recently heard a groan issuing from a chest he was handling. He at once investigated and found in the chest a Chinese woman, who had been checked through from Virginia City to Sacramento. The owner of the chest probably heard of the discovery, for the check was not presented.

The politest railway official in America is a passenger conductor on the Wabash Railway. He is a soft-spoken man, with a mildly beaming eye, a tender curve to his lips, an arm like a derrick and a pair of shoulders as broad as a death warrant. When he roots an impecunious tramp out of the woodbox, he doesn't shake the skeleton out of the trembling wretch. He just asks him the usual questions and then, in tones as soft and gentle as a man trying to borrow money, says, "I will have to ask you to get off at the next station." And every time the man gets off. This *fabula docets* the power of kindness, when it is backed up by a 285-pound striking muscle.—*Burlington Hawkeye.*

—Mr. Henry C. Wentworth, General Passenger Agent of the Michigan Central, has been granted leave of absence on account of ill health, and will spend several months in the East. He has been a most faithful and efficient officer of the company for a great many years.

RAILROAD GAZETTE

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CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

CONTENTS.

EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

THE MASTER CAR-BUILDERS' CONVENTION.

It must be confessed that in commenting on the conventions of railroad officers which are held annually, it is sometimes difficult to say of them anything either very novel or important to be said. The danger which attends them is that the proceedings and deliberations may fall into a certain beaten track, and thus, like twice-told tales, they may lose their interest to those who attend the meetings. Thus, in the early years of the Master Mechanics' Association, there was a yearly report and discussion on steel tires. Annually the members were obliged to listen to a dull reiteration of the number of miles run to successive thirty-seconds and sixteenths of an inch of wear of the tire, until the whole thing became an intolerable bore. How far this sort of thing was due to the stimulating influence of the manufacturers and dealers in steel tires is not now, and probably never will be, made apparent; but it became evident that the consideration of the subject had been continued long after there was any interest or profit in it to the Association. Now it is this kind of danger which lurks constantly about these conventions, and their success will depend largely upon the way in which the members succeed in bringing forward subjects for consideration which are of real interest and value.

If the success of the convention which has just been held at Niagara is determined by the interest of the subjects presented, a glance over the proceedings will show, it is thought, that they represented real, practical issues of very great importance. The attendance was quite large, probably equal to that of any other meeting. The reports were somewhat meagre, and in some cases no reports at all were made by the committees appointed last year. This, of course, is to be regretted, as the plan of appointing committees to investigate different subjects is a very excellent one, which, if properly employed, may be the means of collecting a great deal of information which cannot be secured in any other way.

The plan of soliciting from members questions for discussion at the annual meeting was this year unexpectedly prolific. More questions were handed in than there was time to discuss. In a number of cases several questions covering nearly the same points, and others which were trivial and which were not worthy of being presented for discussion, were offered. The Association, therefore, did well to authorize a committee to take charge of the whole matter and exclude or modify the questions handed in, so as to bring them before the meetings in the most effective form. This system will have the effect of introducing many fresh subjects suggested by different persons and thus give a variety to the topics considered which the usual plan of appointing committees to report on certain selected subjects did not secure. It is proposed by this committee to solicit members to present questions for discussion and announce those selected some time before the annual meeting is held, and also to invite certain members to open the discussions, thus giving them time for preparation and for collecting useful data and facts.

Another new feature adopted at the Niagara meeting proved to be very successful and promises to become one of the chief sources of interest at the meetings hereafter. This year, as at all previous meetings, there were a number of manufacturers and inventors present with different articles which they desired to bring to the notice of the members. Heretofore such persons have been obliged to exhibit them as best they could, and by button-holing the master car-builders induce them to look at what they had to show. No recognition has heretofore been given to this class, who have always attended the meetings. This year an announcement was made by the President that a meeting would be held at 8 o'clock in the gentlemen's parlor of the hotel, where those who had any objects to exhibit could show and explain them to those present. The room was too small for the purpose, but the result showed that the plan could be made very successful. The Pratt & Whitney Company, of Hartford, Conn., had sent a complete set of its taps and dies made to the Franklin Institute standard, and also a set of gauges for taps and dies, and another set of what are called Whitworth gauges. Readers of the *Railroad Gazette* know how frequently attention has been called in these pages to the want of uniformity and accuracy of workmanship in screw threads, and the great evil growing out of it. It has seemed impossible to impress this fact upon master mechanics and master car-builders. Both of their associations have, it is true, adopted the Franklin Institute or Sellers system of screw threads as the standard. This has unfortunately been supposed to be simply a specified number of threads to the inch. The result is that the form of thread and the diameter of the screw have seldom or never been right, and thus the bolts made at one shop do not fit the nuts made at another. As we have pointed out, master car-builders could not be made to realize that $\frac{1}{100}$ of an inch in the diameter of a screw might make all the difference between a good and a bad fit. The exhibition of the Pratt & Whitney Company was therefore very opportune, and with its gauges it showed to the members of the Association what really good workmanship is. Mr. Grant, the representative of the Pratt & Whitney Company, had secured some nuts taken at random from cars found at the station at Niagara. On testing them on the gauges they were found to be so loose that they would rattle on the gauge when shaken. In the afternoon, before the meeting for the exhibition of the articles referred to, the members of the Association visited the Buffalo car shops of the New York Central & Hudson River Railroad on a special train provided for that purpose. In the evening some merriment was caused by the production of some new nuts made at that place and testing them on the gauges exhibited. Although the "United States" standard is employed in all the car shops of the New York Central & Hudson River Railroad, the nuts made there were so loose that they would shake on the gauge, and yet they were much more nearly accurate than any of the others tested. Fortunately, too, Mr. Chanute, of the Erie, or rather the New York, Lake Erie & Western, was present, and he presented some facts which were of much interest, and which, too, it is believed, helped to open the eyes of those present. Some years ago a "standard" system of screw threads was adopted on that line. The taps and dies for each shop were made at home. A short time ago the Pratt & Whitney Company was requested to examine the bolts and nuts made at each shop and measure them accurately, for diameter, form of thread, and pitch or number of threads to the inch. We have not all the data at hand, but it will be sufficient to say that none of them were of the right size, and all varied from each other, and yet it was supposed that the bolts and nuts used on the Erie Railway were all of a "standard" size. Few persons, in fact, realize the propensity which all standards have to depart from the original, unless the utmost care be taken to preserve accuracy. It would, no doubt, be very greatly to the advantage of many railroads to have the bolts and nuts used on their lines inspected in the same way as the Erie Company's were, and doubtless all who do so will be surprised at finding how far from the true standard their workmanship is. Another fact came out during the discussion. It was stated that generally the screw threads used were larger than the standard sizes. That is, a $\frac{3}{4}$ bolt would be $\frac{3}{4}$ and $\frac{1}{16}$ in diameter, and so of other sizes. The reason for this was said to be that bar-iron was generally larger than the standard sizes, and therefore it was found necessary to increase the size of the dies in cutting threads on the rough iron. The weight of iron of the large diameter is, of course, greater than it would be of the true size. The total difference was estimated at about 8 per cent., amounting on the Erie road to about $1,200 per year, a leak which is worth looking after, and which, doubtless, could be found on all railroads. Those persons, too, who are disposed to cavil at the Master Car-Builders' Association, and to think that it does no useful work, are recommended to take the hint which these facts will suggest, have their bolts and nuts tested, and estimate how much more iron they buy annually than they need because of such inaccuracy, and then consider whether there are not some useful ideas elicited by these meetings.

Besides the Pratt & Whitney Company's exhibit, Messrs. Wilson, Walker & Co., of Pittsburgh, showed some steel centre-plates for cars, made to take the place of cast-iron ones. We expect to give an engraving of them in an early number, and will, therefore, reserve a description until then. The same firm exhibited a very difficult forging of steel to take the place of the heavy casting used in the Thielsen truck between the channel iron transoms. The difference in weight was in each case very great between the steel and the cast iron. Three of Professor Thurston's small oil-testing machines were also shown. An india-rubber brake hose covered with wire armor so as to protect it from injury was also shown, but unfortunately we have not the maker's name or address. A freight car seal lock, Wilson & James' flexible blinds for cars, a car coupler, the Congdon brake-shoe, Watson's oil-box cover, Ames' car coupler, Griffith's continuous draw-bar, Safford's draw-bar, vulcanized fibre dust-guards, a remarkable and wonderful exhaust ventilator by which the smoke from the locomotive chimney was to be conducted from the front end of the train to the rear, and Hopkins' journal bearing were all exhibited and explained by persons who were present, and the result was that those in attendance spent a pleasant evening. Altogether such meetings promise to be a prominent feature of the conventions hereafter.

The committee on standard axle made no report, but one of its members explained that the Master Mechanics' Association had appointed a committee and instructed it to communicate with the committee of the Car-Builders' Association. The latter committee was therefore continued, and instructed to coöperate with the others, and a resolution was adopted inviting the Eastern and Western Railroad Associations to appoint one or more experts to meet with these committees. The whole subject will therefore receive the fullest consideration, and should there be any reasonable unanimity between the committees it will be very sure to result in establishing a standard axle beyond any future question.

During the visit to the Buffalo car shops there was an opportunity of seeing what an enormous quantity of duplicate parts must be constantly carried in order to maintain repairs of the through line cars. It seems almost pitiable that this should continue, when a very little agreement among the different roads would establish uniformity. Probably it has heretofore been too early to do this. There has thus far been a steady improvement in the construction of cars, but we have now reached a point when it will make little difference whether one axle or another is used, provided they are all alike.

The place selected for holding the next annual meeting is Chicago, and the day of the week has been changed from Wednesday to Tuesday, as it was found that toward the close of the week there was a general tendency on the part of members to turn their faces

homeward; and it was thought that by beginning a day earlier this would, in a measure, be avoided.

Altogether the verdict must be that this Association is in better working condition than ever before, and its usefulness seems to increase rather than diminish.

THE UNION AND KANSAS PACIFIC CONTRACT.

We made some comments last week on the reported combination of the Union Pacific, the Colorado Central and the Kansas Pacific, but since that time the text of the contract has been published. This is somewhat different from that which was reported last week, as appears below:

	Percentage allotted. First report.	Contract.
Union Pacific	71	72.858
Omaha Bridge	4	2.776
Colorado Central	6	4.673
Kansas Pacific	19	19.693
Total	100	100.000

This is about a third less to the bridge and a quarter less to the Colorado Central than was at first reported. It also appears from the contract that the division is made on the basis of the traffic of 1877, and that provision is made for the yearly revision of the basis of division, which is to be founded substantially on the earnings of the several lines during the previous year. This would seem to be a disclaimer on the part of the Kansas Pacific that the refusal of the Union Pacific to prorate has unnaturally depressed the Kansas Pacific earnings. Nothing is said in the contract as to such prorating in the future, and as the three roads are hereafter to be "managed, operated and controlled as one property" "under the direction of the Union Pacific Railroad Company," it is not likely that a policy will be permitted which will eventually result in reducing the share of the Union Pacific. If the basis of division were permanent, then it would make no difference to either by what line the traffic should be carried: but with a yearly revision of the contract virtually on the basis of the previous year's earnings, it becomes to the interest of each to earn as much as possible and get as large a share as possible of the traffic which might go by either route, in order to affect its proportion of the next year's earnings.

There is, too, a provision to meet the difficulty which we mentioned last week concerning a division of gross earnings without regard to traffic. This is to the effect that the road carrying more freight than its proportion shall withhold 50 per cent. of the earnings therefrom as compensation for the cost of carrying that excess. This then, so far as freight is concerned, makes it a pool of net earnings, or assumed net earnings, rather than of gross earnings. It is expressly stipulated, however, that no such allowance for expenses shall be made with regard to passenger earnings.

The machinery for determining each company's share of the aggregate earnings nominally gives each party to the agreement equal power; that is, one arbitrator each is appointed by the Union Pacific, the Omaha Bridge, the Colorado Central and the Kansas Pacific. But as the Union Pacific controls directly and absolutely the Omaha Bridge, and, though indirectly, doubtless quite as absolutely the Colorado Central, it seems actually to have the appointment of three of the four arbitrators, and so will be able to dictate the appointment of the fifth arbitrator when the four cannot agree. With the Union Pacific thus controlling the arbitrators in the future, and actively directing the conduct of the business of all the roads from the beginning, from the results of which the arbitrators are directed to construct the basis of the future distribution, it would seem to have pretty nearly complete power, which by the terms of the contract is to last for fifty years.

The Kansas Pacific, it is known, is now in the hands of receivers, who thus necessarily become parties to the contract, or rather agree to it and recommend it to the court by which they were appointed, and it is the court which will be a party to the contract if it approves it. The contract states expressly that it is made subject to the approval of the court.

It doubtless will be advantageous for the bondholders of the Kansas Pacific to avoid any conflict between that road and the Union Pacific for the Colorado traffic; and the court is put in possession of the property in order to preserve it and its proceeds until the rights of the several claimants can be decided, and those to whom the control is found to belong can have organized in such a way as to be able to manage the property for themselves. But it would seem to be a questionable use of the power of a court under such circumstances to make a contract which will deprive the owners of the property of any voice in its management for fifty years. If the court ratifies this contract it will, when the receivership is ended by foreclosure or adjustment, hand over to the owners not the road and its equipment, but simply a title to a certain share of the earnings of a system of railroads, less than one-half of which belongs to them. However advantageous such a contract might appear to be, a court, we should say, should hesitate to make it to extend beyond the period of its responsibility for the property, without evidence that it was desired by a decided majority of all those who may, at the close of the litigation, become entitled to the property. The Kansas Pacific bondholders, who probably will at some time become the proprietors of the property of the company of which they are now creditors, are represented in this country by agents and in part by the receivers; and it is possible that they indorse this combination, and that evidence of their approval has been or will be presented.

Hitherto, as we have said, the actual competition of the Union and the Kansas Pacific has been limited chiefly to the Colorado traffic—the traffic centering at Denver—and that competition has not lasted long, as the Union Pacific connection has been but recently completed. This traffic is considerable and it may be profitable; but it was not likely to be profitable so long as the two roads were contending for it. So far as this business is concerned, the contract is likely to be advantageous to both roads. The Union Pacific will get a full share of the business at full rates which the Kansas Pacific formerly had pretty much to itself, instead of perhaps a similar share of the business at half rates. But as to the rest of the traffic, which probably is nine-tenths of the whole, it is not easy to see how the two roads can interfere with each other much, unless it is intended to admit the Kansas Pacific to the through traffic. The Colorado Central and the 106 miles of the Denver Pacific which is worked by the Kansas Pacific are but a few miles apart, it is true; but then there is but one point on either where there is any traffic worth quarreling for. Then for most of the distance to the Missouri River the two roads are 150 miles apart. Both have a considerable local traffic, which grows, and as for some 300 miles east of Denver and Cheyenne this traffic consists chiefly of cattle, which their owners would make nothing of driving a greater distance to secure some advantage in freights, it might appear that there would be an advantage in the combination for local freights. But this very ability of the cattle to carry themselves causes the combination of these two roads to fail to be effective in preventing competition. These are not the only roads that the cattle can reach, and for the Kansas Pacific the Atchison, Topeka & Santa Fe is a much more formidable competitor than the Union Pacific.

Nor does a compact between the Union Pacific and the Kansas Pacific give them full control of the Denver and Colorado traffic. From Kansas City to Denver there is another, though more indirect route, by the Atchison, Topeka & Santa Fe and the Denver & Rio Grande. Owing to the difference in gauge, freight must be transferred by this route; but if high rates should be maintained by the two direct roads, doubtless these roads would gain considerable traffic and some profit by entering the market as competitors, which, indeed, we believe they have done heretofore.

The Control of the New York, Lake Erie & Western.

In London, on the 4th of this month, there was held a meeting of the stock and bondholders of this company to hear the report of the reconstruction trustees, who then finished their labors in that capacity, though, it seems, only to enter upon a new career in a vastly more responsible and powerful capacity. Some modifications were made in the reconstruction after it was first proposed, and since its terms were published in these columns, not all of which we are now able to point out. But what is particularly noticeable now would hardly have attracted attention then. At that time the question was as to the sacrifices to be made by the different classes of stock and bondholders, what assessments should be paid on the stock, how many coupons of the bonds should be funded, and what should be given for assessments and funded coupons. Now that the reorganization has been effected, there is more interest in knowing how the control of the road is to be exercised. As the bondholders refrained from their right to take sole possession of the property to the exclusion of the stockholders, it was natural and proper that they should insist on some voice in the management. This has been given them, first, by vesting one-half of the stock in "voting trustees" appointed by the bondholders, and second by giving voting powers to the bondholders—a vote, we suppose, to every $100 of bonds, though the trustees' report does not say so explicitly. The "voting trustees" are to retain the stock until six per cent. dividends on the preferred stock shall have been paid for three consecutive years. If, then, the road should never earn such dividends on the preferred stock, it would seem that the control of the property would be forever exercised by the voting trustees.

By the reorganization scheme, three of the eight reconstruction trustees were made the first voting trustees, and at the meeting in question, the other five were added to the number, and, as it appears, these gentlemen have power to appoint their own successors, and it does not appear that the bondholders have any authority over them whatever, though the report says, "it is intended that they shall meet the bondholders and proprietors once a year, present a report, and consult with them on all important matters affecting the property."

The trustees say of their own duties: "Thus, in their new capacity of voting trustees the reconstruction trustees will have to act as a committee in London to coöperate with the direction in America until the full dividend has been paid on the preference shares for three years consecutively." Rather, we should say, they are the direction, as a body of eight men—and a permanent body, too—which chooses a board of seventeen directors, will certainly dictate the policy of the road rather than the board. And this appears to be especially the case just now, for in reporting the names of the seventeen directors chosen when the new act of incorporation was filed, the report says that "it is understood and agreed that the entire board hold their seats at the disposal of the proprietors, and will make vacancies for any new members whom it may be desired to place on the board."

But if this committee has great and novel powers, it has some great advantages. No one needs to be told how much efficiency is gained by a permanent tenure, if the power is once lodged in proper hands. And the voting trustees, so far as known to us, are generally recognized in England as men of exceptional ability and character. The three original "voting trustees" were Sir Edward Watkin, Mr. Thomas W. Powell and Mr. John Westlake. Among the five added afterward are, we believe, Mr. John M. Douglas (whose letters on the faults of American railroad organization will be remembered, and who has had experience in English and Canadian boards), and Mr. O. G. Miller and Mr. Robert Fleming, the two representatives of Scotch bondholders, whose letters and reports on the Erie were almost the first evidence that any one on the other side understood the situation of the property.

There is much in the report submitted by the reconstruction trustees which we should like to refer to, but it reaches us too late for an extended discussion. We can only add now that the trustees say of the litigation which twice caused a postponement of the foreclosure sale and the consequent reorganization, "that the real instigators of such proceedings are perfectly well known, and their motives and objects perfectly well understood, and that the bondholders and proprietors owe a great deal to Mr. Jewett and the legal gentlemen engaged, for their persevering and successful efforts to defeat the obstructionists in their attempt to get the property into their 'grip.'"

Grain Shipments by Lake and Rail.

The movement of grain from the Northwest by lake and rail was one of the most interesting phenomena of traffic during the season of navigation in 1876. Then for the first time were rail rates so low as to permit any formidable competition for grain shipped through to the seaboard for export. But from the opening to the close of navigation in 1876 the railroads took grain from Chicago to New York at 20 cents per 100 lbs., and less, which was as low as any ordinary lake and canal rates had then been. There was great deal of grain to move in the first part of the season—the surplus of the large crop of 1875—and the railroads got about half of it, and nearly twice the quantity they had ever carried before when navigation was open. Last year nominally there was no such competition, though so many contracts had been made at the rates of 1876, lasting until July of 1877, or thereabouts, that probably most of the grain that moved by rail was carried at those rates. But the total to be moved was so very small that the share going to the railroads was no greater than they had usually got in years of higher rates for delivery at interior points in the East for domestic consumption.

Were we to compare the shipments by lake and by rail for the whole season of navigation, we should have to take periods of unequal length; navigation opened so much earlier this year than usual that the lake shipments to date have been larger than ever before, even when the railroads carried comparatively little. The effect of the railroads in diverting the grain traffic from the lakes can be judged only by comparing the shipments by both routes when navigation has been fully

open. This we do below for the five weeks ending June 1 for a period of five years:

Shipments of Grain from Northwestern Markets, April 28 to June 1 for Five Years.

Year.	By Lake.	By Rail.	Total.	Per cent. by rail.
1874	15,152,931	5,256,020	20,408,951	25.8
1875	8,739,254	5,246,388	13,985,642	37.5
1876	9,745,457	10,230,255	19,975,712	51.2
1877	8,555,369	4,934,232	13,489,601	36.5
1878	14,696,579	8,786,246	23,482,825	37.4

About a million bushels a week, it appears, goes to the railroads under almost any circumstances, probably because so much is required for the supply of that domestic demand which can be accommodated better by the railroads than by the lake. So much the railroads got in 1874, when the movement was heavy, and the rail rates were what now we would call high; so much also in 1875, when the whole movement was over a third smaller, and the rates were still remunerative; and so much in 1877, when again the movement was light, and the actual rates received by the roads were probably very low, though they were not making new contracts at those rates to divert lake shipments. But the great reduction of rates in 1876 enabled the roads to get a larger proportion than ever before of the exceptionally heavy total shipments, and to increase their average weekly shipments from one to two millions of bushels.

This year, probably, scarcely any grain was taken by rail in May at more than a 20-cent rate; much, probably, at a less rate. Yet with a much heavier movement than ever before, the railroads have not only got a much smaller proportion of the total than in 1876, when their rates were about the same as this year, but a smaller absolute quantity—about 1,860,000 bushels weekly, against 2,000,000 in 1876. This seems to us significant, tending to prove that such reductions in rates as were made in 1876 for the first time, will no longer have the effect they had then. That is, the water route is a more formidable competitor for the grain traffic now than it was then. Then, with circumstances similar to those of this year—a very heavy movement and very low rail rates—the lake vessels could not get half the grain; this year they get five-eighths of it, and more than they ever carried before in the corresponding period.

Comparing with last year, there was in the five weeks an increase of very nearly 10,000,000 bushels in the total shipments of grain from the eight Northwestern markets. Of this increase only 3,850,000 bushels, or 38½ per cent., has gone by the railroads, while 6,150,000 bushels, or 61½ per cent., has gone by the lakes. Note the difference between this change and that from 1875 to 1876. There was an increase in the total shipments of 6,000,000 bushels from 1875 to 1876, of which 5,000,000 went by rail and only 1,000,000 bushels, or 16⅔ per cent. by lake. That is what a 20-cent rail rate effected in 1876. Now, we see, it has effected nothing of the kind. The vessels seem to command the grain traffic almost as well as they did before 1876. They have met the reduction in rail rates by a reduction in their own rates which had been thought almost impossible; and though the smaller vessels complain much of the unprofitableness of their business, the additions made to the larger class of vessels indicate that the lake reductions may be permanent, and that if the railroads ever again secure more than half of a heavy grain traffic while navigation is open, they must accept even less than their present unprofitable rates.

With the canal the matter is different. Even now, with the extremely low canal rates, the charge from Buffalo to New York, equivalent to about 420 miles of rail distance, is 4 cents a bushel for corn, while by lake from Chicago to Buffalo, equivalent to 540 miles of rail distance, the rate is 1¾ cents. Evidently competition with the canal may be successful when competition with the lake is hopeless. The present canal rate, however, is equivalent only to a 17-cent rail rate from Chicago to New York; but the lake rate is equivalent to less than a rail rate of *six cents* per 100 lbs. from Chicago to New York. The transfer charges at Buffalo add considerably to the cost by the water route, however, and that is properly chargeable to the lake, as the railroads which receive by lake at Buffalo (or Erie) are subject to it. But there is no prospect whatever that the cost of carrying by rail from Chicago to Buffalo can be made as low as the present price by lake.

Government Railroad Administration in France.

The railroad administration adopted by the French Ministry of Public Works for the system of secondary roads in Southwestern France, whose working has been committed to it provisionally, is worth noting as the plan of a government which has had greater experience in the art of administration than any other, probably, and has at its command great corps of trained experts, technical and administrative. But the management which the French Minister de Freycinet has adopted hardly takes any account of these, and is almost an exact copy of the French company administrations. The government does nothing directly except to appoint a council of administration, similar to our board of directors, which will be held responsible for the management of the roads which the government has purchased. It then, as it were, washes its hands of the matter. The council is to appoint a general manager, who will have the appointment and direction of all the working staff of officers and employés, and therefore will be responsible to the council as it is to the Ministry of Public Works and the government. The council, however, fixes the pay of all the employés. The number of members of the council is nine, and of them, two are senators of France, two deputies, or members of the French Parliament, one a member of the Council of State, one an officer of what is there called the "court of accounts," which passes upon the accounts of public officers; the others are a merchant, the chief engineer of a great manufacturing establishment, the manager of a great French iron works, and an engineer of the government corps of bridges and highways who has had experience as superintendent of the operation of a railroad, which is an occupation in which many of this corps are engaged, the French railroads being very largely officered by members of this corps.

The difficulty avoided by this arrangement is the apparent incompatibility between a government management and the government inspection and supervision universal in France. It is also supposed that in this way the management of the roads may have something of the simplicity, directness and promptness which are appropriate to commercial enterprises, but which are almost universally lacking in the proceedings of government officials, who, in France at least, insist on acting formally, according to fixed methods, and have too little in view the object to be effected, and too much the machinery for effecting it. In his exposition of his motives for adopting this method of administration the Minister says that "it will permit the state to keep outside, in a measure, of a sphere which does not appear fitted for it. It will intervene, just as it does with regard to the chartered railroads, only to control, to approve the timetables, indorse the tariffs, and enforce the application of the laws and regulations." For this reason the system of inspection and supervision by government officers is left just the same as if the roads belonged to a company, and the public will have its rights enforced on the government roads precisely as on the others.

This plan, which has yet to be carried out, is warmly approved by one of the ablest of the Belgian journals, which commends it as an example for Belgium, which has had forty years' experience with government railroad management, of which this journal says that it is "too bureaucratic, too much given to red tape, too much suspected, rightly or wrongly, of the passive force of administrative inertia."

The French council is expected to be a substantially permanent body; that is, its tenure will not be dependent upon that of the Minister of Public Works, whose position depends on the politics of the Parliament. It is, therefore, expected to have time to mature plans and to carry them out, being judged by the results and nothing else, and having all the authority necessary, not being trammeled by the necessity of referring everything to the department. The latter appoints the council, and then, as it were, abdicates, and uses its whole machinery not to direct, but to watch and check—as other railroad managements are watched and checked—the council which it has created.

Atlantic & Great Western Reorganization.

The Atlantic & Great Western reorganization seems to be indefinitely postponed. A meeting of the bondholders, called by the reorganization trustees, was held in London, June 4, but not apparently for any purpose unless it was to permit them to make suggestions or otherwise relieve their minds. The only suggestion that the trustees had to make was that they continue to do nothing until there should be some change in affairs which might make it appear advisable to take action. This seems somewhat discouraging, but really the trustees give very good reasons for their inaction and for continuing the policy further. They have now all the necessary power to proceed with a foreclosure and reorganization; but, as they very well say, a reorganization would be worse than useless unless there is a prospect that the reorganized road will earn profits enough to pay the fixed charges under the reorganization scheme, and no such prospect is now visible. Money must be had after foreclosure to pay the Receiver's debt, and money cannot be borrowed while the road's profits are so insignificant. Then even the representatives of the usually too sanguine proprietors do not hope to earn the interest required under the reorganization scheme without some additions to or improvement of the property, none of which will be possible unless money can be borrowed. And to the trustees the receivership seems to be the safest thing just now. Under it the property will be kept for the bondholders, at at all events, until they are ready to take charge of it themselves. Considerable stress was laid on the new connection with the New York Central, but only as likely to give them a new bidder for their traffic and to deliver them from their dependence upon the Erie alone, no exclusive connection with the New York Central being hinted at. Mr. C. E. Lewis, M. P., the Chairman of the Trustees, spoke very bitterly of "the ridiculously low and insignificant rates of freight," and said that matters then were "about as bad as they had ever been, if they were not worse, since the beginning of the receivership," and was "unable to understand upon what principle, or want of principle, matters were thus managed among the Railway companies of America;" and in this feeling he will have many sympathizers on this side of the Atlantic.

Mr. James McHenry had a new scheme to present to the meeting, providing for a reorganization without foreclosure, which Mr. Judah P. Benjamin (formerly of Louisiana and Attorney-General of the Confederate States, but now one of the most eminent lawyers in London) told him could be done under the laws of Ohio by the consent of two-thirds of the stock, two-thirds of each class of bondholders, and two-thirds of the other creditors. He had proposed this to the trustees, and found fault because they did not adopt the plan; and he also expressed his confidence that the road might be made to earn $2,000,000 a year just as it is. He found great fault with the drawback paid on petroleum to the Standard Oil Company, and intimated that most of the passengers on the road traveled on free passes. "No one in America," said he, "thinks of paying for railway transit who happens to be acquainted with a director, manager or railway official." He moved to have his plan substituted for that of the trustees, but, an opposing motion being made recommitting everything to the trustees and expressing confidence in them, Mr. McHenry withdrew his motion, and the meeting adjourned without taking any action whatever, leaving the trustees to act or not to act hereafter, according to their discretion. The future of the property therefore it is not possible even to guess.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Utica & Black River.—On the *Ogdensburg & Morristown* extension track is laid from Morristown, N. Y., east by north 6½ miles.

Brooklyn, Flatbush & Coney Island.—Track is laid from Atlantic avenue, Brooklyn, southward to Coney Island, 8 miles, completing the road.

Lake Huron & Southwestern.—The first track is laid from Tawas City, Mich., southwest 4 miles. It is of 3 ft. gauge.

This is a total of 18½ miles of new railroad, making 432 miles completed in the United States in 1878, against 583 miles reported for the corresponding period in 1877, 687 in 1876, 312 in 1875, 570 in 1874, and 1,271 in 1873.

LAKE AND CANAL RATES are lower—lake rates about a quarter of a cent and canal rates about half a cent a bushel, but the figures now are not quite so low as they were last year at this time. There is a great deal more to carry this year, and the vessels are actually carrying a great deal more, in spite of the sharper competition of the railroads. Indeed, it is questionable whether the vessels ever carried so much grain as this year, down to this time. There have been larger iron ore shipments, perhaps, and doubtless larger lumber shipments, but altogether the bulk of lake traffic must have been nearly as great this season as in any previous one in flush times; so that if there has been excessive competition for freights, and lack of employment for vessels, it is not easy to account for it except on the supposition that the capacity of the lake fleet has increased. This probably has been the case, though there is perhaps no increase and perhaps a decrease in the number of vessels. The new vessels have been large ones, and the average cargoes must be considerably larger than they used to be when three cents a bushel was the lowest summer rate, and the average rate for the season five or six cents. Now 1¾ cents is paid for carrying corn from Chicago to Buffalo, while for some weeks last year 1½ cents was the ruling price. The canal rate is but 4 cents a bushel for corn now, so that 5¾ cents, with the elevator charge from Buffalo, which is now we believe less than a cent, pays for carrying from Chicago to New York. This is equivalent to less than 12 cents per 100 lbs. It costs more in many places to ship corn a hundred miles, at local rates, to Chicago, then to ship it from Chicago to New York, and then the local rate is a quite moderate one.

TRUNK LINE PROFITS, about these days, must be extremely moderate, there being a moderate movement westward with a small profit, and a large movement eastward with, we should say, no profit. This view is confirmed by a recent statement of President Vanderbilt given in a conversation on the probability of a railroad strike reported in the *Tribune*, which is: "It is no secret that though the road (New York Central & Hudson River) is doing a great amount of business, it is making no money." From St. Louis and Chicago east to the seaboard ports, this probably describes pretty well the condition of things on all the roads whose traffic is chiefly or largely a through traffic. We have noted recently a considerable decrease in the receipts of grain at Baltimore, and this is explained by a statement we find attributed to Western agents of the Baltimore & Ohio, that it had been refusing freight because of the inadequacy of the rates. The latest news from Chicago is that the roads were taking grain "for whatever they could get;" but that is probably an exaggeration, for lake and canal rates have been reduced only about a tenth, and that partly because of reduced shipments. As soon as it becomes evident in the treasuries of the roads that the expenses of a business exceed the receipts, the companies begin to lose their appetite for it, and witness without pangs of jealousy the shipments by rival roads. Meanwhile there are those who indict the lines to New York of two crimes, first, of charging too little, and so not covering their expenses; and, second, of charging too much, and so permitting traffic to go to Philadelphia and Baltimore.

LOCOMOTIVE PERFORMANCE seems undoubtedly to be greater per engine in this country than anywhere else in the

world, as was indicated by Mr. Evans' paper at the Master Mechanics' Association, and as other statistics also have shown. The Belgium Grand Central Railroad, one of the largest in that country, reports for 1877 that the greatest distance run by any one engine in its service that year was 46,068 miles. The average daily run of the locomotives fired up each day (not of the whole number) was 86 miles. The average distance run by the whole stock of locomotives was 21,560 miles.

NEW PUBLICATIONS.

Uniform Non-Local or "Terrestrial" Time. A memoir by Sanford Fleming, C. M. G., M. Inst. C. E., F. G. S., F. R. G. S., Engineer-in-Chief Canadian Pacific Railway, etc.

This publication is a small pamphlet in which a plan for bringing about a universal system of time is elaborately worked out with some diffuseness.

The plan proposed is to designate each one of the twenty-four hours of the day by letters, the standard to be stationed at Washington, Greenwich or anywhere else, the object being to distinguish "terrestrial" time from local time, and also to avoid confusion between the hours of day and night.

The plan is almost identically the same as that proposed by a correspondent in the *Railroad Gazette* of May 7, 1870, repeated again in the number of June 22, 1872, and still another time, in that of Dec. 12, 1874.

Some of the suggestions made by the correspondent referred to, and Mr. Fleming, are very strikingly similar. Thus, in the *Railroad Gazette* of May 7, 1870, it is said:

"In order to be explicit it would, therefore, always be necessary to state whether the time named was railroad ['terrestrial'] or local time. * * * With this object in view, it has been suggested that the hours should be lettered, as shown in the cut [not given here], beginning with A for 12 o'clock midnight, and lettering consecutively for the whole twenty-four."

Mr. Fleming says, page 13:

"It is proposed, in order properly to distinguish these, as well as the new time indicated by the standard chronometer, that the twenty-four divisions shall be known by the letters of the alphabet."

The correspondent says:

"This change need not interfere at all with the existing standards of local time, and if it were adopted we would all get new faces to our clocks and watches lettered similar to the cut, and then set the hands to whichever time would be most convenient to us."

Mr. Fleming says, page 26:

"If we take a watch or clock to be used in any particular country, it would be a simple matter to inscribe on its dial the letters which designate terrestrial time."

In the *Railroad Gazette* of June 22, 1872, it is said:

"In our engraving we have made the letters indicating the hours from 6 a. m. to 6 p. m. in outline (or white), and the others, which designate the other half of the day, including or included in the night, black, which would help to a ready apprehension of the part of the day indicated in the locality where the clock might be placed."

Mr. Fleming says, page 28:

"In this design [not given here], it will be noticed that G is assumed to be the meridional or noon letter of the place, and the letters on a dark ground between 8 p. m. and 4 a. m. represent the hours in the two 'night watches.'"

The similarity of ideas, if Mr. Fleming was not acquainted with what has appeared in the *Railroad Gazette*, certainly indicates "a remarkable coincidence of two great minds."

However that may be, it does not alter the value of the proposed plan, and Mr. Fleming has certainly showed some applications of it not heretofore suggested. We also feel authorized in saying that no one will be more ready to feel grateful to the author of the pamphlet than the correspondent of the *Railroad Gazette*, if the former succeeds in introducing the proposed system of "railroad," "terrestial" or "universal" time into general use.

Inspection and Repairs of Cars.

[Report of Committee to the Twelfth Annual Convention of the Master Car Builders' Association.]

To the Master Car Builders' Association:

GENTLEMEN: Your committee to whom was referred the subject of "Inspection and Repairs of Cars" would respectfully beg leave to submit the following:

Circulars heretofore used by committees to solicit or obtain information from members on the various points at issue, have been in this case dispensed with. We therefore submit for your consideration a few of the many important points, brought forcibly to the notice of your committee, by almost daily practical experience.

Your committee is fully impressed with the force and correctness of the axiom "that eternal vigilance is the price of railroading;" and that in the thorough inspection and keeping up the running repairs of cars is found one of the best places to give it a practical application.

In regard to car inspection, we have to say, in the first place, that a full realization of the importance of this part of the work should be had by the master car-builders, and that only such men as have good common sense and experience in car work should be set to perform it, realizing its importance, and having proper and sufficient help to do the work.

There should be close attention given to all details, well followed up, in order to secure a constant, unfailing and faithful carrying out of this branch of the car department. A lack of attention to seemingly small matters at the head will extend all the way through, and casualties will be the result in proportion as they are neglected, this foundation work being very essential for the safe running of our trains.

As you are aware, on all important and leading lines of railroads we have a great variety of cars to inspect, rendering all the more necessary thorough work. Some cars, owing to the construction of their trucks and drawing attachments, are difficult to inspect; while others by their mode of construction are easily examined and defects discovered.

While we do not propose to lay down rules to be followed in all cases, there are some things which it seems desirable should be done.

As has already been suggested, there should be careful, thorough work in all cases where time will permit, requiring inspectors to mark all defects, however small, in such a way as to call attention to them. Especially should this be done in the running gear and drawing attachments—such as a bolt out or a nut off. We hear men say at times "It is all safe; there is but one bolt out." But, was the bolt put there in the first instance needlessly or for ornament? If so, it had better be left out and the hole plugged up. We are aware there are cases when bolts cannot be replaced without unnecessary expense and delay of freight, and the car may go on with perfect safety; but none of these reasons should excuse the inspectors for neglecting their duty to mark such defects. This course acts as a check also and indicates at once whether or not the men are faithful in performing their duty.

Another thing which to some may seem a small matter, and yet it is really one of importance, the neglect of which has caused the loss of many lives, the injuring of many more, and the payment of thousands of dollars damages. It is the careful inspection of brake-wheels to see they are securely fastened.

The inspector cannot tell the true condition of brake-wheels on the top of box or stock cars as he passes alongside of his train. It can be inspected only by passing along the top and examining each brake with care. There is no part of the train with which the men have so much to do—except perhaps in the matter of coupling—in which they are thrown in such dangerous positions, as in applying the brakes, dependant as they are for their safety and efficiency as brakemen, their hold being almost entirely upon the brake-wheel, and this being securely fastened is of the utmost importance. And again it is only from the top of the car that the condition of ratchet-wheel, panel or dog, can be learned. In many cases a first-class brake in every other respect is rendered almost useless by absence of a key or ratchet dog.

We have spoken of these seemingly small and minor details, believing, if they are faithfully carried out, the prominent ones, such as inspection of wheels, draw-bars, oil boxes, etc., will not be overlooked.

The rules adopted at our last meeting in regard to interchange of cars seems to cover all the points necessary for the inspection of cars of connecting lines.

In regard to freight-car repairs, we think it is becoming year by year more apparent that unnecessary expense and delay attend this part of our work, and very largely owing to the want of uniformity in the construction of cars, more especially in the trucks, draw-bars and their attachments.

That there is a great diversity is not to be wondered at, when we consider the rapid growth of railroads in our country. They are not the isolated affairs they were twenty or twenty-five years ago, sustaining only remote or contingent relations with other roads, each constructing its rolling-stock according to the notions of some one working comparatively independent of others. These roads have now become a part of a vast system, co-extensive almost with the limits of a continent, having relations with each other so close and intimate that community of interest has grown up to a very great extent, unavoidable and indispensable, and, withal, desirable. And in no part of their operations is it more plainly to be seen than in the use of their rolling stock.

The motive power is kept at home, while the cars, from necessity are required to go the length and breadth of our land, and are only restricted in their course by the two oceans that wash our shores.

Cars are not indestructible, and, from the character of their service, must at times give way; and how important it is to all that some uniformity of construction be adopted, instead of the endless variety now in use, which is a constant source of extra expense, annoyance and delay.

The variety which now exists seems all the more needless when we look over the field and see to what extent the variations are owing to some slight modification in the construction of what, in its essential point, is the same thing, varying just enough to render the parts of any one useless for all others.

It is sometimes said that a knowledge of the cause of a difficulty is a long step toward a knowledge of how to remove or overcome it; but this case is probably an exception. While we may know the cause, its removal is not so easy. And yet the difficulty does not rest alone with our superior officers. We have only to read the reports and discussions in our meetings to see that there is such a wide diversity among ourselves as to almost preclude the possibility of united action, so necessary as a first step toward bringing about a change in this direction for the better. This want of uniformity not only increases the expense and inconvenience attending repairs, but results in many cases in having the work done in a very unworkmanlike manner.

The want of proper material leads to some makeshift to get the car off our hands, and so renders it necessary to have the work done over again when the car gets home.

In the rules unanimously adopted at the last meeting of our Association to govern the interchange of cars, the fifth rule reads as follows:

"When cars or parts of cars are repaired or replaced by companies not owning the same, the standard form and materials used in the original construction shall be followed in detail. Any company departing from this rule shall be liable for the cost of changing the same again to its standard, proper credit being given for materials removed."

Now, it would seem from this to be not only our privilege, but our duty also, to do the work over in order to prevent our cars from becoming a combination of the many different styles—a medley, so to speak, made up of portions of cars from all sections of our country.

While there are difficulties in the way of bringing about this uniformity so important as a means of cutting down expenses and facilitating repairs, we do not look upon it as by any means hopeless.

If by a unananimous vote, or one nearly so on the part of this Association, we say that a certain drawing attachment or truck, for instance, is as strong and sensible and costs no more to apply or build and maintain it, and that we recommend its adoption as a standard, even though it might be no better than some other, it seems reasonable that a matter of so much importance will be given attention and be largely adopted. We believe that in the adoption of the standard axle and oil box a long step in the right direction was taken, and the wisdom of the Association has been fully vindicated by the number of roads that have adopted it. The same may be said in regard to the standard height of draw-bars—a great change has been wrought and we hear little or nothing said now of the danger and damage so generally complained of a few years ago, as arising from the variation of their heights.

In view of the foregoing, and with these precedents before us, we therefore recommend to your earnest consideration the subject of uniformity—or rather this want of uniformity—in freight car trucks and draw bars if nothing more; that something may be devised and approved by which this difficulty will be overcome and this leak stopped. Small though the leak may be at any one given point, yet in the aggregate it has thousands in it.

In regard to the lighter class of running repairs on freight equipment, the like inspection should be done thoroughly, and much will be saved by a prompt application of the "stitch in time" or "ounce of preventive" treatment.

Quite a large proportion of this has to be done in the freight yards, without drawing the cars from the regular trade.

Another class of repairs, such as draw-bars and their attachments, trucks, roofs, etc., cannot be done without withdrawing them. Where repairs are of this class, a suitable or hospital track should be provided, passing through a roomy, open shed, where all repairs of this class can be done thoroughly and systematically, dropping the cars in at one end and out at the other when repairs are completed.

JOHN MCVAY,
W. H. H. ALLISON,
M. P. FORD,
} *Committee.*

Rules Governing the Condition of, and Repairs to, Freight Cars for the Interchange of Traffic; Revised at Niagara Falls, June 12, 1878.

RULE 1.—Any railroad company receiving the cars of another company for the purpose of running them over its road, or otherwise using them, will be required to return them in as good general condition as they were in when received; or if this be not done, the expense necessary to restore them to such general conditions will be charged to the company so receiving or using them.

All cars delivered to connecting lines must be in good running order, with journal boxes and bearings in good condition; wheels sound, free from flat spots exceeding two and one-half inches in length or diameter, or flanges with flat vertical surface, extending more than seven-eighths of an inch from tread of wheel, or less than one inch thick; axle journals not less than two and three-quarter inches in diameter, and brakes and draw-bar attachments in efficient condition. Each company to give foreign cars upon its line the same care and attention given its own. The company running the car to be responsible for oiling and packing.

RULE 2.—Wheels and axles used to replace those broken under fair usage, and wheels worn-out on same axle as wheel broken, will be charged to the company owning the car. Closely connecting lines may, however, furnish wheels or axles to replace those broken under their cars, when giving notice previously of such choice, and paying freight and duty to destination on wheels or axles furnished and scrap returned. Second-hand wheels may be used (without charge, except for labor of refitting) to replace wheels removed from other causes than breaking. When only one wheel is put on an axle, it must be of the same circumference as the other wheel on same axle.

RULE 3.—Prices for wheels and axles to be as follows:

One new 33 in. narrow-tread wheel (less old) fitted on same axle	$9.00
One broad-tread wheel (less old) fitted on same axle	10.00
Two new 33 in. narrow-tread wheels (less old) fitted on same axle	17.00
Two broad-tread wheels (less old) fitted on same axle	19.00
One new axle, turned and fitted (less old)	8.00

Loose wheels may be refitted on second-hand axles, and charged $2 per wheel or per pair. No charge to be made for the axle, and all shop marks on such wheels and axles must be reported upon the bill to the road owning the car. Prick punching the wheel-seat of axle or shimming the wheel shall not be allowed.

RULE 4.—One railroad company rendering bill against another for wheels and axles *shall note on bill* the manufacturer's name and date found on such wheels or axles removed, together with the railroad company's marks, with the number, class and line of cars from under which they were taken, and date of removal, and shall mark on the inside hub of the wheel substituted the date of its application.

RULE 5.—If an accepted foreign car is injured upon a road, it shall be repaired by and at the expense of the company in possession thereof as promptly as it repairs its own cars, under the following provisions:

Such repairs shall be permanently and thoroughly made, and shall conform to the design in detail of the original construction, provided the same can be determined from the car itself; and with the same form, kind and quality of material originally employed, except when the companies agree to substitute for broken parts new standards, such as those adopted by the master car-builders.

RULE 6.—Cars must be returned to connecting lines in as good general condition as when received, and each company must bear the expense of running repairs to all cars while upon its line.

RULE 7.—Car inspectors at terminal or junction stations, and agents at junctions, where there are no inspectors, must promptly inspect, on arrival, all cars offered for interchange, and make a record of the defects of cars not in good order, and decline receiving them until the needed repairs are made; provided, however, in case a car has defects which do not render it unsafe to proceed on its journey before being repaired, the inspectors may note such defects, and the car be accepted, subject to being received back in the same condition. In such cases, a card 4½ × 6½ inches, in the form shown below, may be affixed under the body of the car for the guidance of other inspectors, preferably on the outside of the intermediate sill near the centre of car, stating the defects with which the car will be received back:

Name of Road.

Car No.....Date.....
Initial.....Line.....
Will be received at.....
with the following defect:

_____

_____

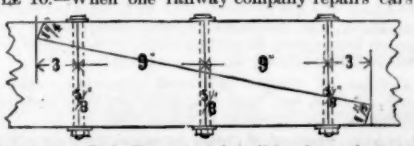
_____

Signature _____

RULE 8.—When cars are destroyed on foreign roads, the owners must be notified immediately, that a settlement may be speedily effected; in settling it shall be optional with the company destroying whether it will rebuild the car or pay the cost of replacing it, less six per cent. per annum upon the yearly depreciated value of the parts destroyed since last built. In case of disagreement on any point not covered by this rule, each company shall appoint an arbitrator with power to select a third party, to decide the point of difference or fix upon the value of the car.

RULE 9.—In case the delivering and receiving inspectors disagree as to the condition of a car, the case is to be immediately referred to their superior officers.

RULE 10.—When one railway company repairs cars for



another (as per Rule 7), material shall be charged at current market price, and fifteen per cent. added to the net cost of the labor.

RULE 11.—Sills broken or materially injured must be replaced by new ones of the same size and of good quality; an exception to be made of intermediate and outside sills to which the draw timbers are not attached, which, if broken between bolster and end sill only, may be spliced with a

"ship splice," as here shown, of not less than twenty-four inches in length and secured by three five-eighth-inch bolts, all in a workmanlike manner.

RULE 12.—Iron castings (interchanged) shall be charged at two and one-half cents per pound. Journal bearings, twenty-five cents per pound.

RULE 13.—Any railroad company may become a party to these rules by giving notice of its adhesion, through its general manager or superintendent, to the Secretary of the Master Car-Builders' Association.

Each company may withdraw from its participation in these rules by giving 30 days' notice to other roads through a general circular.

RULE 14.—These rules shall take effect on and after July 1, 1878.

RULE 15.—Upon an application to the President of the Master Car-Builders' Association in writing from seven railway companies, parties to this agreement, it shall be the duty of the said President to call another meeting for revision of the rules.

O. CHANUTE,
Assistant Genl. Supt. New York, Lake Erie & Western R. R.
W. B. SNOW,
Master Mechanic Illinois Central Railroad.
LEANDER GAREY,
Supt. Car Depart. N. Y. Central & Hudson River R.R.
JOHN KIRBY,
Genl. Master Car-Builder, Lake Shore & Michigan Southern Ry.
W. MCWOOD,
Master Car-Builder, Grand Trunk Railway.
F. D. ADAMS,
Genl. Master Car-Builder, Boston & Albany Railroad.
B. K. VERBRYCK,
Master Car-Builder, Chicago, Rock Island & Pacific R.R.
ENOS VARNEY,
Master Car-Builder, Fitchburg Railroad.
R. M. HEMPHILL,
Master Car-Builder, Toledo, Peoria & Warsaw Railway.
S. A. DAVIS,
Master Car-Builder, Boston, Lowell & Nashua Railroads.
ROBERT MILLER,
Master Car-Builder, Michigan Central Railroad.
HENRY CHILDS,
Master Car-Builder, Great Western Railway.
C. F. HANSON,
Master Mechanic, Detroit & Milwaukee Railroad.
C. E. GAREY,
Master Car-Builder, New York & Harlem Railroad.
C. W. HAMMANN,
Master Car-Builder, North Pennsylvania Railroad.
R. B. MORE,
Master Car-Builder, Flint & Pere Marquette Railroad.
J. P. COULTER,
Master Car-Builder, Ohio & Mississippi Railway.
R. A. PACKER,
President Geneva, Ithaca & Sayre Railroad.
R. A. PACKER,
General Manager Cayuga Railway.
R. F. GOODMAN,
Assistant Genl. Supt. Pennsylvania & New York Canal & R. R. Co.
E. R. BROWN,
Master Car-Builder, Lehigh Valley Railroad.
H. D. TITUS,
Southern Central Railroad Company.
L. B. PAXSON,
Mechanical Supt. Philadelphia & Reading Railroad.
JOHN S. LENTZ,
Lehigh Valley Railroad Co.
J. MARSH.
Master Car-Builder, Vt. & Mass. Division, Fitchburg R.R.
J. H. F. WIERS,
Master Car-Builder, Atlantic & Great Western Railway.
J. W. MARDEN,
Master Car-Builder, New York & New England Railroad, Norwich & Worcester Division.
GEO. C. WATROUS,
Master Mechanic, Detroit, Lansing & Northern Railroad.
U. H. KOHLER,
Master Car-Builder, Wabash Railway.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends have been declared as follows:

Lehigh Valley, 1 per cent., quarterly, payable July 15. On July 13 payments will be made to ladies only.

United New Jersey (leased to Pennsylvania), 2½ per cent., quarterly, payable July 10.

Boston & Lowell, 2 per cent., semi-annual, payable July 1.

Rome Railroad Company (of Georgia), 2½ per cent. This is the second dividend declared this year.

Providence & Worcester, 2 per cent., semi-annual, payable July 1. The company formerly paid 5 and then 4 per cent.; it passed its dividend in July of last year, but resumed last January, paying 2 per cent.

Southern Minnesota, interest-dividend of $37.45 per bond, on the construction bonds, payable July 1.

Kentucky Central, 3 per cent. on the preferred and 1 per cent. on the common stock, both semi-annual, payable June 28.

Foreclosure Sales.

The tolls and franchise of the *Nashua, Acton & Boston* road for one year are advertised to be sold in Nashua, N. H., July 25, to satisfy a judgment for $33,500 sued out by John C. Moulton.

The sale of the *Leavenworth, Lawrence & Galveston* road has been postponed from June 5 to July 10.

The sale of the *Alexandria & Fredericksburg* road has been indefinitely postponed, pending the trial of a cross-petition filed by certain creditors to determine how much of the road is covered by the mortgage.

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—It is reported that Mr. J. F. Goddard, now Assistant General Freight Agent of the Chicago, Burlington & Quincy, will be appointed Freight Agent of this road July 1.

Auditor of Pacific Railroad Accounts.— Theophilus French, of Ohio, has been appointed by the President and confirmed by the Senate to this new office.

Brooklyn, Flatbush & Coney Island.—Mr. James N. Smith has been chosen President, in place of John A. Lott, resigned on account of ill health.

Canada Southern.—The following directors have been chosen for this company's leased and controlled lines: *Canada Southern Bridge.*—James Tillinghast, E. D. Worcester, Aug. Schell, S. F. Barger, W. L Scott, E. A. Wickes, W. K. Vanderbilt, Sidney Dillon, J. W. Converse. *Chicago & Canada Southern.*—Elisha Atkins, J. W. Converse, Sidney Dillon, David Dows, B. F. Ham, A. L. Pritchard, John Ross, I. N. Smith, E. A. Wickes. *Erie & Niagara.*—Cornelius Vanderbilt, James Tillinghast, E. D. Worcester, Augustus Schell, S. F. Barger, W. L. Scott, E. A. Wickes. *Toledo, Canada Southern & Detroit.*—Cornelius Vanderbilt, J. Tillinghast, E. D. Worcester, Augustus Schell, S. F. Barger, W. L. Scott, E. A. Wickes, Joseph Harker, George W. Davis.

Central Branch, Union Pacific.—Mr. M. A. McLaughlin has been appointed General Freight and Ticket Agent, with office at Atchison, Kan. He was formerly Traveling Auditor of the Wabash.

Cincinnati, Hamilton & Dayton.—At the annual meeting in Cincinnati, June 11, the following directors were elected: R. M. Shoemaker, Rufus King, J. N. Kinney, Preserved Smith, Joseph Rogers, Martin Bare, L. B. Harrison, Theodore Cook, Henry Lewis. The only new member is L. B. Harrison, who takes the place of J. W. Hartwell, of Cincinnati. At a subsequent meeting of the board, R. M. Shoemaker was reëlected President.

Cincinnati, Wabash & Michigan.—At the annual meeting in Goshen, Ind., June 7, the following directors were chosen: H. B. Payne, A. B. Stone, H. Chisholm, J. H. Defrees, H. Caldwell, C. W. Cowgill, C. E. Cowgill, Thomas McNamil, C. W. Chapman, S. C. Baldwin, J. H. Wade. The board elected J. H. Wade, President; S. C. Baldwin, Vice-President; W. S. Jones, Secretary; C. W. Lepper, Treasurer.

Cumberland & Ohio.—At the annual meeting, held June 5, it was decided to divide the company into two distinct corporations, and the following directors for each were chosen: *Cumberland & Ohio, Northern Division.*—G. King, J. W. Crawford, A. B. Veach, J. D. Guthrie, J. A. Middleton, J. A. Pickett, Adam Middleton, O. Farmer, S. F. Campbell, S. R. Norton, Wm. P. Beard, Yoder Poignard, G. G. Gilbert, Dr. J. R. Hughes, B. A. Wilson, *Cumberland & Ohio, Southern Division.*—J. M. Caldwell, N. S. Ray, Joseph Spaulding, Andrew Offut, H. B. Phillips, Marion County, Ky.; B. W. Penick, J. O. Grove, E. H. Hobson, Samuel Blakeman, James S. Buchanan, J. H. Chandler, Dr. W. L. Turner, R. E. Jeter, James T. Caldwell, J. N. Turner, Taylor County, Ky. This board elected E. H. Hobson, President; J. McCord, Secretary and Treasurer.

Dayton & Southeastern.—Mr. J. E. Gimperling, late General Passenger Agent, has been appointed General Superintendent, in place of O. S. Pease. Mr. Gimperling was formerly General Superintendent of the Indianapolis, Bloomington & Western, and was at one time on the Ohio & Mississippi.

Georgia.—Major Hamilton Wilkins is appointed Roadmaster. He recently held the same position on the Western Railroad of Alabama.

Hannibal & St. Joseph.—Mr. W. C. Alberger has been appointed Superintendent of the Western Division. He was at one time General Superintendent of the Buffalo, New York & Philadelphia, and has since, we believe, been in Florida, in connection with the Great Southern Railroad project.

Mr. C. W. Winslow has been appointed Purchasing Agent.

Jacksonville, Pensacola & Mobile.—The United States Circuit Court has appointed Sherman Conant, of Jacksonville, and A. B. Hawkins, of Tallahassee, Fla., Receivers, in place of Calvin H. Allen, retired. The change is made on account of some controversies among the parties in interest.

Kansas Pacific.—Mr. Peter B. Groat, General Passenger Agent, is appointed General Ticket Agent also, in place of D. E. Cornell, resigned.

Keokuk & Des Moines.—At the annual meeting in Keokuk, Ia., June 6, the following directors (one-third of the board) were chosen: Henry A. Barling, David Dows, C. S. Johnson, all of New York. Mr. Dows is a new director representing the Rock Island Company.

Milwaukee, Lake Shore & Western.—At the annual meeting in Milwaukee June 12, the following directors were chosen: Joseph Vilas, Manitowoc, Wis.; James H. Mead, Sheboygan, Wis.; Isaac H. Knox, St. Louis; Delwynn Parrish, Philadelphia; Samuel S. Sands, Brooklyn, N. Y.; Chas. Dana, Wm. H. Guion, Henry B. Hammond, Wm. K. Hinman, Morris K. Jesup, Adam Norrie, Gordon Norrie, Frederick W. Rhinelander, New York.

Minneapolis Eastern.—The first board of directors is as follows: Joel B. Bassett, Charles A. Pillsbury, Carroll T. Hobart, George W. Goodrich, Edwin R. Barber, Francis S. Hinkle, Leonard Day, Jabez M. Robinson, Ransom D. Warner. Office at Minneapolis, Minn.

New York, Lake Erie & Western.—Mr. George H. Griggs has been appointed Master Mechanic in charge of the Western and Buffalo Division shops at Hornellsville, N. Y. Mr. Griggs was formerly Master Mechanic of the Flushing & North Side and of the Southern Railroad of Long Island; in 1874 he was appointed Superintendent of the Keokuk & Des Moines and in 1876 left that road to take charge of the Connecticut Valley, where he remained until recently.

Newport & Maysville.—At the annual meeting in Newport, Ky., recently, the following directors were chosen: John Byrne, W. H. Clement, Alfred Gaither, Thomas D. Lovett, J. H. Rhodes, Alexander Swift, C. W. West, E. H. Woodward.

Owensboro & Nashville—At the annual meeting in Louisville, June 13, the following directors were chosen: James Weir, J. Sanderson, Owensboro, Ky.; E. H. Caldwell, Russelville, Ky.; John G. Barret, J. S. Barret, G. H. Cochran, Louisville, Ky.; J. J. Brown, New Albany, Ind.

Pacific Railroad Commissioners.—During the last hours of the session the House passed the Senate bill for a Pacific railroad commission, by the terms of which Charles Francis Adams, Jr., Albert Fink, and an officer of the corps of engineers to be appointed by the President, are to be the three commissioners.

Peoria, Pekin & Jacksonville.—At the annual meeting in Peoria, Ill., June 14, the following directors were chosen John Allen, John H. Allen, James M. Constable, George T. M. Davis, James F. Kelsey, Lucius A. Smith, S. A. Trowbridge. The board reëlected John Allen, President; W. C. Phillips, Secretary.

Western, of Alabama.—Mr. Cecil Gabbet is appointed Roadmaster, in place of Mr. H. Wilkins, who has gone to the Georgia road.

Western, of Minnesota.—At the annual meeting in St. Paul, Minn., recently the old board was reëlected, as follows: C. B. Wright, Geo. Stark, L. E. Reed, Geo. L. Becker, N. W. Kitson, F. R. Delano, S. E. Neiler, Alexander Ramsey, W. W. McNair, C. A. Pillsbury, C. A. Gilman, D. Morrison, Geo. W. Case. The company is controlled by the Northern Pacific.

Wisconsin Valley—At the annual meeting in Tomah, Wis., June 12, the following directors were chosen: Thomas B. Scott, Alexander Stewart, of Wisconsin; James F. Joy, Detroit; Sidney Bartlett, Francis Bartlett, John A. Burnham, John N. Denison, H. H. Hunnewell, Nathaniel Thayer, Jr., Boston; Wm. J. Rotch, New Bedford, Mass.

PERSONAL.

—Mr. George P. Goodwin, Land Commissioner of the Chicago & Northwestern, died at his residence in Evanston, Ill., June 13.

—Mr. Calvin H. Allen, formerly Receiver of the Paducah & Memphis, and for some time past of the Jacksonville, Pensacola & Mobile, has been relieved from the duties of that position by the United States Circuit Court. The Court stated that Mr. Allen's management of the road had been satisfactory, the change being made only to avoid the appearance of any discrimination between the parties in interest.

—Mr. Andrew R. Culver, President and chief owner of the Prospect Park & Coney Island, a Brooklyn suburban road, retires from his position and offers his interest in the property for sale at auction.

—Daniel E. Davenport, of the railroad contracting firm of John E. Gowan & Co., has filed a voluntary petition in bankruptcy in New York. His liabilities are stated at $101,025; assets, $94,000, the principal item being a claim for $75,000 against the Covington, Columbus & Black Hills Company, which is now in suit.

—Mr. D. E. Cornell has resigned his position as General Ticket Agent of the Kansas Pacific Railroad.

—Capt. W. W. Bragdon, for nine years Superintendent of Bridges of the St. Paul & Sioux City road, has resigned his position.

—At the meeting of Erie stock and bondholders in London, June 4, called to receive the report of the reconstruction trustees, a resolution was adopted unanimously to present to W. W. Macfarland, Esq., who conducted the litigation in the foreclosure suit, a testimonial of the value of 100 guineas, "with a suitable inscription recording the high appreciation of his honor, zeal, talent and courage in carrying through the foreclosure and sale in face of an opposition of an unprecedented character."

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Five Months ending May 31:

	1878.	1877.	Inc. or Dec.		P. c.
Cairo & St. Louis	$85,197	$103,757	D.	$18,560	17.9
Chi., Burlington & Quincy	5,402,631	4,514,313	I.	888,318	19.7
Clev., Mt. Vernon & Delaware	150,791	149,005	I.	1,786	1.2
Gt. West., of Can	1,901,580	1,700,130	I.	201,450	11.8
Ind., Bloom. & West.	530,239	494,306	I.	35,933	7.3
International & Gt. Northern	510,548	584,595	D.	74,047	12.7
Paducah & Memphis	80,068	73,699	I.	12,369	16.8
St. L., Alton & T. H., Belleville Line	184,515	203,412	D.	18,897	9.3
St. Louis & San Fr.	554,786	514,763	D.	59,977	11.7
Month of May:					
Cairo & St. Louis	$24,239	$23,333	I.	$906	3.9
Chi., Burlington & Quincy	1,157,447	917,447	I.	240,000	26.2
Clev., Mt. V. & Del.	30,388	35,868	D.	5,480	15.3
Ind., Bloom. & West.	103,987	107,309	D.	3,322	3.1
Int. & Gt. Northern	80,706	82,010	D.	1,304	1.6
Paducah & Elizabethtown	24,970	24,202	I.	768	3.2
Paducah & Memphis	19,336	16,424	I.	2,912	17.8
St. L., Alton & T. H. Belleville Line	36,204	35,232	I.	972	2.8
St. Louis & San Francisco	93,270	99,116	D.	5,846	5.9
St. L. & S. E., St. Lo's Div.	46,021	43,892	I.	2,129	4.8
Kentucky Div.	29,037	23,296	I.	5,741	24.6
Tennessee Div.	18,071	12,640	I.	5,431	42.1
First Week in June:					
Atchison, Topeka & Santa Fe	$60,000	$39,719	I.	$20,281	51.1
Chi., Mil. & St. Paul.	147,000	144,187	I.	2,813	2.0
Denver & R. Grande	18,507	12,501	I.	6,006	48.0
St. Louis, Iron Mt. & Southern	72,900	72,512	I.	388	0.5
Week ending May 31:					
Gt. Western, of Can.	$78,766	$77,539	I.	$1,227	1.6
Week ending June 8:					
Grand Trunk	$153,579	$155,335	D.	$1,756	1.1

Grain Movement.

Receipts and shipments of grain of all kinds for the week ending June 8 for the past five years have been, in bushels, as follows:

The receipts of the eight Northwestern markets for the week:

1878.	1877.	1876.	1875.	1874.
3,591,073	2,215,000	6,094,854	2,108,200	3,785,257

These receipts this year are the smallest for six weeks, and 45 per cent. less than those of the previous week, which were perhaps the largest ever known. They are, however, 62 per cent. greater than the receipts of the corresponding week last year.

The shipments of these eight markets for the same week have been:

1878.	1877.	1876.	1875.	1874.
4,542,030	2,783,325	5,042,385	2,692,067	3,897,590

These shipments are the smallest for three weeks, but are only 10 per cent. less than those of the previous week, and have been exceeded but four times this year. They are 63 per cent. greater than the shipments of the corresponding week in 1877 and 10 per cent. *less* than those in 1876.

The number of bushels and the percentage of the total of the above shipments that were sent by rail were as follows:

1878.	1877.	1876.	1875.	1874.
1,169,514	624,387	2,147,670	852,903	1,083,705
24.8 p. c.	22.4 p. c.	42.6 p. c.	31.7 p. c.	27.8 p. c.

The quantity and the proportion are both the smallest for five weeks, and the quantity is 41 per cent. less than the previous week. Indeed, the last week, though showing smaller total shipments than four others this year, shows much the largest lake shipments—3,372,516 bushels.

The receipts of the seven Atlantic ports for the same week have been:

1878.	1877.	1876.	1875.	1874.
5,898,607	3,294,502	4,973,426	3,002,150	4,878,691

The receipts this year are nearly 80 per cent. greater than for the corresponding week last year, and nearly a fifth greater than in any previous corresponding week. They have been exceeded in each of the three preceding weeks, but only twice before (last October) for years, if ever.

Of the receipts for the week this year, 46.9 per cent. was at New York, 17.8 at Philadelphia, 11.4 at Baltimore, 10.8 at Boston, 9.1 at Montreal, 3.9 at New Orleans, and 0.1 at Portland. Baltimore's receipts are below its average in the

winter, but Philadelphia's are 70 per cent. above its winter's average and New York's 80 per cent. above that average. Philadelphia seems nearly to have balanced by greater rail and water receipts the advantage which New York has had from the opening of the water route.

Receipts and shipments at Chicago and Milwaukee for the week ending June 17 were:

	Receipts.	Shipments.
Chicago	1,347,880	2,190,546
Milwaukee	283,600	362,800

Not only are the Chicago receipts 62 per cent. less than those of the previous week; they are 71 per cent. less than those of the week ending June 3.

For the same week receipts and shipments at Buffalo by rail and by water (receipts by lake and shipments by canal) are reported as follows:

	Receipts.	Shipments.
By rail	334,900	757,850
By water	2,274,809	1,368,786
Total	2,609,709	2,126,636
Previous week	2,596,078	2,578,474

Of the receipts for the last week 13 per cent., and of the shipments 35⅓ per cent., were by water.

For the same week the receipts of the four leading Atlantic ports were 3,967,546 bushels, of which 2,362,787 bushels arrived at New York, 726,700 at Philadelphia, 513,059 at Baltimore, and 365,000 at Boston. Of the receipts at New York, 28½ per cent. were by rail.

Water Rates.

Lake rates have fallen from 2 cents to 1¾ for corn from Chicago to Buffalo, and about a quarter of a cent more for wheat.

Canal rates have fallen about half a cent a bushel to 4½ cents for wheat, 4 for corn and 3 for oats from Buffalo to New York

Ocean rates are substantially unchanged—the range being from about 7d. by sail to 8¼d. by steam per bushel for grain from New York to Liverpool. It now costs more than twice as much to get the grain from New York to Liverpool as to get it from Chicago to New York. The whole cost of transportation from Chicago to Liverpool is about 24 cents a bushel for wheat.

Coal Movement.

Coal tonnages for the week ending June 8 were:

	1878.	1877.	Inc. or Dec.	P. c.
Anthracite	476,939	463,493	I. 13,457	2.9
Semi-bituminous	69,746	71,225	D. 1,479	2.1
Bituminous, Pennsylv'a.	38,117	.....	.....	.....

Anthracite shows an increase, the first time for many weeks.

The coal tonnage actually passing over the Pennsylvania & New York road for the six months of its fiscal year ending June 1 was as follows:

	1878.	1877.	Decrease.	P. c.
Anthracite	282,572	389,382	106,810	27.4
Bituminous	156,433	176,525	20,092	11.4
Total	439,005	565,907	126,902	22.4

The coal tonnage of the Pennsylvania Railroad for the five months ending May 31 was as follows:

	1878.	1877.	Inc. or Dec.	P. c.
Anthracite	239,438	280,800	D. 41,362	14.7
Semi-bituminous	586,372	594,415	D. 8,043	1.5
Bituminous	647,860	643,287	I. 4,573	0.7
Coke	419,990	373,746	I. 46,244	12.4
Total	1,893,660	1,892,248	I. 1,412	0.1

Coal shipments from Seattle, Wash. Ter., for May were 14,243 tons; five months, 38,427 tons. This coal is brought down over the Seattle & Walla Walla road, and nearly all of it goes to San Francisco.

THE SCRAP HEAP.

Railroad Manufactures.

The Baldwin Locomotive Works have an order from the Government of New South Wales (Australia) for one first-class passenger engine and two consolidation freight engines. It is said that the works will deliver 31 engines this month.

Bradley & Co., at Syracuse, N. Y., lately shipped six of their patent cushioned hammers to Sheffield, England.

The Keystone Mill, at Pittsburgh, is running double turn in the puddle department and in the bar mill. The guide and plate mills are on single.

The Agawam Iron Works, Wareham, Mass., are running steadily and with good prospects of steady work through the summer.

The Nova Scotia Forge Co. is about to remove its works from New Glasgow, N. S., to Smelt Brook, a few miles away, to secure a better supply of water.

At the annual meeting of the Rome (N. Y.) Iron Works, recently, Edward Huntington was chosen President and J. Whaley Vice-President.

The Dickson Manufacturing Co., at Scranton, Pa., has an order for six engines for the Chicago, Pekin & Southwestern, and has inquiries from many other companies.

Messrs. W. H. Bailey & Co., of the National Locomotive Works at Connelsville, Pa., give notice that, owing to financial embarrassments they will be compelled to close their works for the present.

At a largely-attended meeting of creditors of Kimberly, Carnes & Co. last week, it was resolved to accept the following compromise: Kimberly, Carnes & Co., to pay 70 cents on the dollar; Ætna Iron Co., 70 cents; Bradley, Reis & Co., 50 cents; Neshannock Iron Co., 30 cents. To pay these amounts it was agreed that Kimberly, Carnes & Co. should have an extension of four years, and the other firms three years each. To secure these payments the property will be mortgaged to trustees, who will be hereafter be designated by the creditors. This agreement was signed by all the creditors present. The mills of Bradley, Reis & Co., at New Castle, Pa., and the mill at Sharon, Pa., will probably resume in a short time.

Mr. Charles M. Atkins has added to his rail mill at Fishbach, Pa., the necessary machinery for the manufacture of iron girders.

The New Albany (Ind.) Rolling Mill has a contract for 1,200 tons of 35-lbs. iron rails for the Indianapolis, Delphi & Chicago road.

The Philadelphia & Reading Railroad shops, at Reading, Pa., are building four freight engines to burn coal dust after Mr. Wooten's method.

The Stewart Furnace, at Sharon, Pa., is making 40 tons a day of Bessemer pig iron, which is shipped to the Pennsylvania Steel Co. and Cleveland Rolling Mill Co.

The Chickies Iron Co., at Chickies, Pa., blew out its No. 1 furnace last week after a run of 4½ years. The stack is to be repaired and will then go into blast again.

The *Iron Age* of June 13 says: "Business as a rule continues much depressed, and the feeling in the iron trade is gloomy in the extreme. We are glad to note, however, that there is increasing activity in connection with the railway and iron shipbuilding interests, and as these are of leading importance, it is hoped they will impart strength to other departments. At the Baldwin Works we find that orders for upward of 160 locomotives have been entered since the first of the year, with indications that the demand will be fully maintained. Since March, 1877, the firm have also turned out upward of 50 street motors, with a constantly increasing demand. The steel rail mills have already orders on hand sufficient to employ them for several months, while in bridge work the amount of orders entered since the first of the year is enormous." It reports a considerable demand of iron for car-building, and one order in the market for 4,000 axles. Orders for about 50,000 tons of steel rails were in the market to be placed. The sales of iron rails have been unimportant, and all in small lots, at prices varying from $32 to $34.50 at the mills, and sellers are firm. There is very little demand for old rails, and smaller sales in Philadelphia at $18.50 to $19 are reported. A small lot of old car wheels sold at $17.50 per ton.

The Paris correspondent of the New York *Herald*, speaking of the American exhibits at the Exposition, says: "The fine display of iron work by Senator Barnum, of Connecticut, is one of the most attractive things for manufacturers in the whole exhibition."

Bridge Notes.

In a recent notice of the letting of the New River and other bridges on the Atlantic, Mississippi & Ohio road to the Edge Moor Iron Co., we accidentally omitted to state that the contract was let through Mr. Fred. H. Smith, of the Baltimore Bridge Co., who had charge of the work as Engineer to the Receivers.

The Passaic Rolling Mill Co., at Paterson, N. J., is building a highway over the Passaic River at Belleville, N. J.

The Edge Moor Iron Co., at Wilmington, Del., has just shipped to Galveston, Texas, an iron bridge of three spans of 160 feet each, also one span to Matanzas, Cuba. The company continues to be quite busy in the shops, having now in course of construction an iron roof for the Fairmount Avenue Market House in Philadelphia; a riveted lattice deck bridge of six spans, 152 ft. each, for a New York railroad; quite a number of plate girder spans for sundry roads, and the iron gates for Lock No. 5, Great Kanawha River. The company is preparing for the immediate commencement of work on one mile of elevated railroad on Ninth avenue, New York, for joint account of the New York Elevated and Metropolitan Elevated Railroad companies.

OLD AND NEW ROADS.

Brooklyn, Flatbush & Coney Island.—The track is now all laid on this road, and it is to be formally opened for travel about June 25. It runs from the Long Island Railroad's Atlantic avenue line, near Classon avenue in Brooklyn, southward to Flatbush avenue, near the Willinck Entrance to Prospect Park, and thence through Flatbush to Coney Island; it is about 8 miles long, and of standard gauge. It is intended to secure a share of the pleasure travel to Coney Island, and the company also owns a large hotel at the terminus on the beach. Its standard gauge and connection with the Long Island Railroad will make it possible for trains to be run from the heart of Brooklyn, and if arrangements are made to that effect with the Long Island road, it will probably be able to secure a large share, if not the largest, of the Brooklyn travel.

Chesapeake & Ohio.—Notice is given that all bondholders who desire to join in the reorganization and have not yet deposited their bonds with the Central Trust Company in New York, must do so before July 1, as the Purchasing Committee is required to make a settlement by that date.

Chicago, Milwaukee & St. Paul.—A Des Moines correspondent of the Chicago *Tribune* writes as follows: "The Milwaukee & St. Paul Railroad Company is reaching out over the State with wonderful energy, and in a few years will span it in all directions. It has taken possession of the Dubuque Southwestern, and already that road begins to show the evidences of the energy and enterprise of the lessee. A glance at the map will show that this is an important link in the chain of roads of that company, and when it is carried to its objective point Chicago must look a little out, as President [General Manager] Merrill is noted for long-headedness. An old charter has been revived to build the Cedar Rapids, Ottumwa & Sigourney road. The road-bed was prepared for the iron several years ago and abandoned for nearly fifty miles. The Milwaukee & St. Paul Company now offer to iron and equip this road if the road-bed is prepared. The objective point is Kansas City, and, when completed, will be one of the most important lines in the State. The stone quarries along the Dubuque Southwestern, in Jones County, will prove a bonanza for the road, as they are inexhaustible and the stone is wanted along every mile of the entire Milwaukee & St. Paul lines in Iowa, Wisconsin and Kansas. A meeting of prominent railroad men, of whom were Oliver Ames and John I. Blair, was recently held at Iowa Falls and Cedar Rapids, the portent of which is not yet disclosed, but in view of facts which exist, and needs which are imperative, it is safe to conclude the result will be the completion of the Sioux City & Pacific from Iowa Falls, *via* Eldora to Cedar Rapids, the future railroad centre of the State."

The company has agreed to build a branch of its Hastings & Dakota Division from Glencoe, Minn., to Hutchinson, 16 miles, provided the people on the line will do the grading.

A Milwaukee dispatch says: "The litigation over the La Crosse & Milwaukee Company's bonds has been renewed in the United States Court of this district. William Barnes, of New York City, has entered suit as Trustee against the present Milwaukee & St. Paul Company, and there is a slight prospect that the case may come to trial. The complaint covers 104 printed pages, and the claim is for about $2,000,000."

Chicago, Rock Island & Pacific.—The New York *Evening Post* says: "We find the facts respecting the proceedings of the stockholders and directors of the Chicago, Rock Island & Pacific Railroad Company, at their recent meeting in Chicago in relation to the canceling of the company's stock, and also in relation to giving the stockholders the benefit of the company's surplus, to be as follows:

"1. At the meeting of the directors on the 3d instant a resolution was passed directing the president and treasurer to cancel the certificates representing the forty thousand and two hundred (40,200) shares of the stock owned by the company, which has heretofore appeared in their reports as an asset.

"2. At the meeting of the stockholders on the 5th instant the preamble and resolutions were adopted [as heretofore published].

"3. At a subsequent meeting of the directors on the same day a resolution was adopted referring the matter of the apportionment of surplus to a committee consisting of the president, vice-president, treasurer and general solicitor of the company, this committee to report on the practicability of such apportionment, and a plan for the same, to the directors for their future action. This committee have not yet reported, and the directors have had no meeting since.

"As the laws of Illinois strictly prohibit any scrip, stock or bonded dividend, and as the Rock Island Company cannot part with the stock in which the surplus has been invested without losing control of the lines which the stock represents, it is evident that whatever division is made must be in the form of cash from the surplus net earnings from time to time as they accrue; this, in all probability, will be added to the cash dividends of the Chicago, Rock Island & Pacific Company."

Cincinnati, Hamilton & Dayton.—At the annual meeting in Cincinnati, June 11th, the question of paying interest on the Cincinnati, Hamilton & Indianapolis bonds came up. It was stated at the meeting that the English holders of $250,000 of the bonds would probably assent to the compromise offered by the company in the matter of the Junction bonds. This would increase the total of assented bonds to $1,000,000, or a majority of the issue. It was also stated that an action had just been begun at Hamilton, which, if successful, would prevent the payment of interest on the Cincinnati, Hamilton & Indianapolis bonds, and also prevent the proposed compromise. A letter from the attorney of the company was read, in which he reaffirmed his opinion that the indorsement of the Cincinnati, Hamilton & Indianapolis bonds was illegal, and advised the company not to oppose the action begun at Hamilton to prevent the payment of the interest. It was voted that the company should not oppose the action.

Cumberland & Ohio.—At the annual meeting in Louisville, Ky., June 5, it was resolved to divide the company into two corporations, as authorized by an amendment to the charter obtained last winter. One is to be known as the Cumberland & Ohio, Northern Division, to own the road from Campbellsburg in Henny County, Ky., to Bloomfield in Nelson County; the other, the Cumberland & Ohio, Southern Division, to own the line from Lebanon in Marion County to Greensburg in Green County, and to be composed of all the stockholders south of Washington County, the others composing the Northern Division.

The Southern Division Company voted to accept a proposition from the Louisville & Nashville Company to complete the road from Lebanon to Greensburg, about 30 miles, and to lease the same when finished. The Louisville & Nashville to have the iron now owned by the company and also to receive first-mortgage bonds to an amount equal to the cost of completing the road, which is nearly all graded. The net earnings of the road, after paying interest and an annual sinking fund payment, to be divided, two-thirds to the company and one-third to the lessee. The lessee also to guarantee the bonds.

Dannemora.—The Utica (N. Y.) *Herald* says: "The contract for building the new narrow-gauge railroad from Plattsburg to Dannemora provides for completing the road for the rolling stock by Nov. 15, for $73,000, exclusive of convict labor, the balance of the appropriation being reserved for contingent expenses. The line, as located, follows the Ausable Branch of the New York & Canada Railroad to a point just north of the lake shore highway crossing; bearing thence to the westward, and crossing the river at the State quarry, about half a mile above the Haynes mill, passing just north of the Cadyville Catholic church and cemetery, and running thence in a nearly straight line to the Dannemora plank road, which it crosses, and from there the line swings around the side of the hill, crossing the Separator brook about half a mile below the plank road, and keeping upon the table lands until it reaches the terminus. The total length of the line from the north boundary of the government land to the prison is 16.75 miles; length of the road to be built from where it leaves the Ausable Branch, 15.92 miles. The point where the line ends is about 1,100 feet south of the prison gate. This point is 1,250 feet above the surface of Lake Champlain, 1,200 feet above the point where the line intersects with the Ausable Branch, and 75 feet below the prison gate. The prison gate is 1,325 feet above the lake. It is believed that there is only one rock cut on the whole line, at the river crossing on the east bank, where the rock will have to be cut about five or six feet deep to reach the grade. For a great part of the distance the grade very nearly conforms to the surface of the ground The heaviest cut is 15 feet. On Thursday morning of last week two gangs of men, one at each end of the line, commenced to clear the track of standing timber. It is expected that the work of grading will commence this week."

Denver & Rio Grande.—This company claims that the recent decision in the suit with the Atchison, Topeka & Santa Fe as to the right of way through the Grand Cañon of the Arkansas was only on a preliminary motion, and does not affect the real merits of the case. There was a concurrent right in two rival companies to construct their respective roads through the cañon and to "use and occupy the cañon" for that purpose. The intent of Congress as expressed in the second section of the act of March 3, 1875, is that cañons and defiles in the public domain shall not be monopolized by one company. As both companies cannot go on with the work of construction at the same time, and as the opponents of the Denver & Rio Grande were prior in taking possession, they were allowed to go on with the work of grading, but enjoined from laying iron until further orders, the Denver & Rio Grande to be at liberty to ask for further orders on showing that the Atchison, Topeka & Santa Fe is proceeding improperly, with a view unfairly to monopolize the entire cañon.

The company has given notice that from June 10 it will make no through rates on passenger or freight business to Denver or other Colorado points over the Atchison, Topeka & Santa Fe, and that it will sell no through tickets and give no through bills of lading in connection with that road. This action cuts off the Santa Fe road from access to Denver for the present.

Detroit & Milwaukee.—Receiver Trowbridge reports for May as follows:

Balance, May 1	$47,918.70
Receipts	73,496.01
Total	$121,414.71
Disbursements	64,306.55
Balance June 1	$57,108.16

The receipts were $9,189.46 greater than the disbursements.

Eastern.—The injunction restraining this company from running trains over the Swampscott Branch, from Swampscott, Mass., to Marblehead, has been dissolved.

Keokuk & Des Moines.—At the annual meeting in Keokuk, June 6, the stockholders voted to ratify the agreement for the lease of the road to the Chicago, Rock Island & Pacific.

Lake Huron & Southwestern.—Work is progressing rapidly on this road. Since May 2 it has been graded for 12 miles southwest from Tawas City, Mich., and iron laid for four miles. It is a narrow-gauge road, intended chiefly to carry lumber.

Minneapolis Eastern.—This company has been organized at Minneapolis, Minn., to build a railroad from that city to St. Paul, a distance of 10 miles. The capital stock is fixed at $1,000,000.

Montclair & Greenwood Lake.—At a meeting of

bondholders and creditors, held in New York last week, the following were appointed a committee to prepare a plan in reference to the sale and reorganization of the road: Cyrus W. Field, M. K. Jesup, Edward Cooper, Samuel J. Tilden, Egbert Starr and George W. Stanton, New York; A. W. Benson, Brooklyn; Arthur B Elliott, Troy, N. Y.; Henry S. Pierce, Scranton, Pa.

New York, Lake Erie & Western.—A meeting of security-holders was held in London, June 4, at which the Reconstruction Trustees presented a long report, setting forth in detail the plan of reconstruction adopted, the proceedings taken and the final foreclosure sale and the organization of the new company. The Trustees state that the assents to the plan include $15,932,000 out of $16,656,000 first consolidated bonds and $24,205,000 out of $25,000,000 second consolidated and gold convertible bonds; assessments have been paid on 49,151 out of 85,369 shares preferred and 318,648 out of 780,000 shares common stock, and many more stockholders are expected to come in. The amount available for improvements of the road is estimated at $3,750,000 from stock assessments and $2,250,000 from income saved by funding coupons, or $6,000,000 in all.

The report was accepted and a committee appointed to fix the compensation to be paid to the Trustees for their services.

At a meeting of the board in New York, June 15, it was resolved to extend the third or standard-gauge rail to Jersey City, and the whole matter was referred to the Executive Committee, with full power to have the third rail completed as soon as practicable, and also to equip the road with such necessary standard gauge rolling-stock as may be required.

New York, Westchester & Putnam.—This company, which owns what was at one time the southern end of the New York, Boston & Montreal road, from High Bridge, New York, to Brewster's, is reported to be securing signatures to an agreement, binding it to have the road in running order by July 1, 1879, provided the farmers along the route will pledge their support in the matter of transportation of milk and farm products for a period of five years.

Northern, of New Jersey.—This company's issue of first-mortgage bonds will mature July 1. The amount is $400,000 and the interest 7 per cent. The company now gives notice that holders who desire to extend their bonds 10 years, at 6 per cent. interest, may do so by presenting their bonds at the office of the company, No. 197 Reade street, New York, before July 1, to sign the extension, and receive new interest coupons. Those holders who are not willing to make the extension at the reduced rate of interest will be paid, according to the terms of the mortgage, at the office of the company. Interest has always been promptly paid.

Ohio & Mississippi.—It is reported that some efforts have been made to secure a change in the plan of reconstruction put forward by the committee, but that the representatives of the Springfield Division bondholders are not willing to consent to any alteration

Omaha & National Park.—This company has been incorporated in Nebraska to build a railroad from Omaha through Nebraska, Dakota, Wyoming and Montana to the Upper Yellowstone. The company asks Congress for a land grant.

St. Louis, Alton & Terre Haute.—It is said that the Pennsylvania Company and the Cleveland, Columbus, Cincinnati & Indianapolis have given notice that certain notes given by them for rental due this company will not be paid, unless a modification of the lease is agreed to. The company leases its main line and Alton Branch, 195 miles in all, to the Indianapolis & St. Louis, the rental being 30 per cent. of gross earnings, with a stipulation that it shall not be less than $450,000 yearly. The lease was guaranteed by the Pennsylvania Company, the Cleveland, Columbus, Cincinnati & Indianapolis and the Indianapolis, Cincinnati & Lafayette, but the last-named company afterwards withdrew from the contract, leaving the other two guarantors to make up the deficiency. The net earnings of the leased road have always been less than the minimum rental; in 1877 they were reported at $177,749, leaving a deficiency of $322,251 to be made up. What terms the guarantors desire have not been stated, but officers of this company say that they are not willing to accede to any change, and will, if necessary, take legal steps to enforce the lease. The rentals and interest charges paid by the company last year were $638,592, which was $46,509 less than the rental of the leased line and the net earnings of the line which it still works, so that any serious reduction in the rental would prevent it from paying all the interest accruing. Of its bonds $1,700,000 are income bonds, on which interest is not payable unless earned.

Sandy River Valley.—The town of Phillips, Me., has voted to lend its credit in aid of this road. It is said that this will secure the building of the road this season from Farmington to Phillips, 18 miles. The road is to be of 2 ft. gauge.

Southern, of Long Island.—It is reported that the bondholders' committee has agreed to report in favor of scaling down the second-mortgage bonds to 60 per cent., and the third-mortgage bonds to 40 per cent. of their present amount. A meeting of the bondholders is called for June 25, at which the report will be presented.

Union Pacific.—In Washington last week, in the suit of this company against the Government, the Court of Claims decided that the United States is entitled to 5 per cent. of the net earnings of the road from Nov. 6, 1869 to Nov. 5, 1874, amounting to $1,367,716.73, and that the company is entitled to recover $593,627.10 as one-half of the compensation due from the Government for services rendered, and that for the difference between these sums, $774,089.63, judgment is rendered in favor of the Government.

Union Pacific and Kansas Pacific.—The bill reported from the Senate Judiciary Committee, and which was expected to go through the House (though at this writing we cannot say whether it did), creating a Board of Pacific Railroad Commissioners, after providing for Charles Francis Adams, Jr., of Massachusetts, Albert Fink, of Kentucky, and an officer of engineers to be detailed by the President, as commissioners to serve until Jan. 1, 1879, empowers them to determine:

First. Cost of construction of each division of road.
Second. Cost of right of way and of equipment.
Third. Other items embraced in cost of road not embraced in preceding items.
Fourth. Length of main and of side tracks.
Fifth. Profile of statement showing rate, amount, direction and locality of grades.
Sixth. Radius and locality of each curve, with length of curve on each division.
Seventh. Total length of straight road and total degree of curvature.
Eighth. Number of engines, passenger cars, freight cars, express and baggage cars and other cars.
Ninth. Highest rate of speed allowed for express, accommodation, freight and other trains on each division; also average rate.
Tenth. Rates of fare charged for through passengers for the respective classes per mile, and for local passengers of several classes per mile between the several stations.
Eleventh. Rates charged for freight of all different classes, both local and through, per mile, and between all the several stations.
Twelfth. Number of miles run by passenger and freight trains, both local and through.
Thirteenth. Total number of passengers carried, both local and through, of all classes, and total number of loads and of tons of freight, both local and through, of all classes.
Fourteenth. The monthly gross earnings for the transportation of passengers and also of freight.
Fifteenth. The monthly expenditures for the running of passenger trains, and also of freight trains.
Sixteenth. Expenditures in maintaining and improving road, equipment and other related matters, including labor, motive power, station-houses, buildings and fixtures.
Seventeenth. Monthly gross earnings from the transportation of through and of local passengers, of through and local freight, of mail and express, and from other sources.
Eighteenth. What running arrangements it has with other railroad companies, setting forth the contracts for the same.
Nineteenth. What terminal facilities are provided, and what charges are made therefor, by one of the companies named in the acts aforesaid, to any or either of the others of said companies.
Twentieth. Any other facts or testimony which may aid in establishing equitable rates for the transportation of persons and property over said roads, or any portion thereof, or that, in the opinion of said commissioners, or a majority of them, are material for the consideration of Congress.

In the United States Circuit Court at Leavenworth, Kan., June 13, the Receivers of the Kansas Pacific filed a traffic contract, which was approved by the Court. It provides for a division of the earnings of the roads included as follows:

	Per cent.
Union Pacific	72.838
Omaha Bridge	2.776
Colorado Central	4.693
Kansas Pacific	19.693
Total	100.000

Monthly accounts are to be rendered and if the contributions of any of the parties for any month shall be in excess of its proportion, 50 per cent. of the excess shall be retained. Provision is made for a yearly revision of proportions.

Utica & Black River.—Work is progressing rapidly on the extension of this road from Morristown, N. Y., to Ogdensburg. Last week construction trains were running to a point 6½ miles north by east from Morristown, leaving four miles of track to be laid. It is expected that the road will be finished by July 1. Work is in progress on the depot buildings in Ogdensburg.

Wabash.—Argument before the United States Circuit Court in Chicago on the motion to appoint a receiver in the Tysen suit to foreclose certain mortgages was begun June 12 and continued several days. At latest accounts, however, no conclusion had been reached and no decision given by the Court.

West End.—The town commissioners of Long Branch, N. J., have procured a temporary injunction restraining this company from building its proposed branch of the New Jersey Southern through the streets of the town. The court, however, authorized the company to proceed with the condemnation of the right of way, subject to the final decision in the injunction suit.

ANNUAL REPORTS.

Allegheny Valley.

This company owns the following lines:

	Miles.
Main Line, Pittsburgh to Oil City	132
Plum Creek Branch	7
Total River Division	139
Low Grade Division, Redbank to Driftwood	110
Sligo Branch	10
Total	259

The company also worked the Buffalo, Corry & Pittsburgh road, from Corry, Pa., to Brocton, N. Y., the title to which has been in dispute, and which was recently sold under foreclosure. The report is for the year ending Dec. 31.

The equipment owned consists of 75 engines, 34 passenger and 9 baggage and mail cars, 304 box, 1 stock, 1,212 gondola, 352 oil-tank, 108 other freight and 36 caboose cars; 1 officers', 1 pay, 3 wrecking and 35 gravel cars.

The balance sheet is as follows:

Stock ($8,365 per mile)	$2,166,500.00
Bonds ($90,426 per mile)	23,420,400.00
Other debt	2,718,793.96
Current balances	169,548.86
Total ($109,935 per mile)	$28,475,242.82
Road and equipment ($93,091 per mile)	$24,110,625.74
Materials, cash, balances due	554,985.84
Stocks and bonds	1,018,028.64
Claims in suit, etc	427,419.56
Buffalo, Corry & Pittsburgh road, cost	427,613.53
Profit and loss, debit balance	1,936,569.51
	$28,475,242.82

The bonded debt consists of $4,000,000 River Division bonds; $10,000,000 first and $3,200,000 second-mortgage bonds on Low Grade Division and $6,220,400 income bonds issued under the composition in bankruptcy made several years ago. Of the other debt the principal items are $451,376.76 suspended debt payable in income bonds; $451,214.78 accrued interest, and $1,566,495 coupons on Low Grade Division bonds paid by the Pennsylvania Railroad Company as guarantor and held by that company. All the stocks and bonds owned except $30,000 are of the Pittsburgh, Titusville & Buffalo road. The cost of the River Division is charged at $9,775,130.23, or $74,054 per mile; Plum Creek Branch; $144,315.27, or $20,616 per mile; Sligo Branch, $274,637.10, or $27,464 per mile, and of the Low Grade Division, $11,502,680.61, or $104,570 per mile; equipment of the whole road, $2,413,862.53, or $9,320 per mile.

The earnings for the year were as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Freight	$1,818,975.02	$2,005,825.88	D. $186,850.86	9.3
Passengers	609,516.60	506,216.63	I. 103,299.97	20.4
Express and mail	37,671.79	38,195.16	D. 523.37	1.4
Rents, etc	25,916.52	34,539.45	D. 8,622.93	25.0
Total	$2,492,079.93	$2,584,777.12	D. $92,697.19	3.6
Expenses	1,347,108.49	1,284,843.01	I. 62,265.48	4.8
Net earnings	$1,144,971.44	$1,299,934.11	D. $154,962.67	11.9
Gross earn. per mile	9,621.93	9,979.83	D. 357.90	3.6
Net earn. per mile	4,420.74	5,019.05	D. 598.31	11.9
Per cent. of expenses	54.05	49.71	I. 4.34	8.7

The traffic for the year was as follows:

Train mileage:	1877.	1876.	Inc. or Dec.	P. c.
Passenger	456,342	432,361	I. 23,981	5.5
Freight	1,086,012	1,058,182	I. 27,830	2.6
Service	119,236	114,147	I. 5,089	4.5
Total	1,661,590	1,604,690	I. 56,900	3.5
Pass. train cars	1,752,088	1,722,147	I. 29,941	1.7
Freight cars	19,151,937	17,917,382	I. 1,234,555	6.9
Passengers carried	968,283	812,437	I. 155,846	19.2
Passenger mileage	19,833,405	16,785,768	I. 3,047,637	18.2
Tons freight carried	2,456,536	2,287,274	I. 169,262	7.4
Tonnage mileage	106,609,036	102,551,536	I. 4,057,500	4.0
Average train load:				
Passengers, No.	43.46	38.82	I. 4.64	12.0
Freight, tons	98.17	96.93	I. 1.24	1.3

The chief items of freight were crude oil, coal, iron ore and pig iron and lumber. The mileage of empty freight cars was 44.93 per cent. of the total mileage. The averages per train mile, etc., were as follows, in cents:

	Receipt.	Cost.	Net.
Per train mile, all trains	161.58	89.34	72.24
Per passenger car mile	34.46	16.33	18.13
Per passenger per mile	3.07	1.54	1.53
Per freight-car mile	9.58	5.50	4.08
Per ton per mile	1.71	0.98	0.73

The average rate per ton per mile was 2 cents on the River Division; 1.27 cents on the Low Grade Division, and 3.64 cents on the Sligo Branch. The traffic and earnings were divided as follows:

	River Division.	Low Grade Division.	Sligo Branch.
Train mileage	1,177,477	464,724	19,389
Passenger mileage	17,798,939	1,954,382	80,084
Tonnage mileage	61,573,361	44,402,658	633,017
Gross earnings	$1,829,828.53	$635,960.17	$26,291.23
Net earnings	827,540.50	304,824.39	12,606.55
Gross earnings per mile	13,164.23	5,781.45	2,629.12
Net " "	5,953.53	2,771.13	1,260.65
Per cent. of expenses	54.78	52.06	52.05

Charging each division with its own debt and its proportion of the general debt, it appears that the River Division earned $317,624 above its interest liabilities, while the Low Grade Division's net earnings were $740,106 less than its interest. The result of the year was as follows:

Interest on mortgage bonds, etc	$1,161,071.64
Interest on income bonds	416,600.50
Spent for new construction, etc	104,881.90
Installment on second mortgage, Low Grade Div	100,000.00
Total	$1,782,554.04
Net earnings	1,144,971.44
Deficit	$637,582.60

Of this $377,000 was made up by income bonds issued under the contract for interest and contributions to the contributing companies, and the balance of $260,582.60 was made up by guaranteed Low Grade Division coupons taken up by the Pennsylvania Railroad Company.

Expenses increased owing to lower rates and increased renewals, especially of bridge work and masonry.

BUFFALO, CORRY & PITTSBURGH.

The business of this line was as follows:

	1877.	1876.	Inc. or Dec.	P.c.
Pass. carried	71,819	78,737	D. 6,918	8.8
Pass. mileage	1,690,589	1,761,161	D. 70,572	4.0
Tons freight carried	98,041	166,638	D. 68,597	41.2
Tonnage mileage	3,864,323	6,711,492	D. 2,847,169	42.4
Gross earnings	$117,210.32	$149,028.16	D. $31,817.84	21.4
Expenses	97,111.08	134,134.84	D. 43,023.76	32.1
Net earnings	$26,099.24	$14,893.32	I. $11,205.92	75.2
Gross earning per mile	2,725.82	3,465.75	D. 739.93	21.4
Net earnings per mile	606.96	346.34	I. 260.62	75.2
Per cent. of exps.	77.73	90.01	D. 12.28	13.6

The decrease in tonnage was chiefly in coal. Large renewals of trestle-timbers and rails are needed to make the road safe to work.

Baltimore & Potomac.

This company owns a line from Baltimore to Washington, 43 miles, with a branch from Bowie, Md., to Pope's Creek, 49 miles, making 92 miles in all. Its entrance into Baltimore and connection with the Northern Central are by a tunnel and other very costly works, which have made it a very expensive road. It is controlled by the Pennsylvania and its bonds are guaranteed by that company and the Northern Central.

The earnings for the year ending Dec. 31 were as follows:

	1877.	1876.	Decrease.	P. c.
Gross earnings	$646,322.78	$722,485.56	$76,162.78	10.5
Expenses	534,534.21	600,205.09	65,670.88	10.9
Net earnings	$111,788.57	$122,280.47	$10,491.90	8.6
Gross earn. per mile	7,025.25	7,853.10	827.85	10.5
Net " "	1,215.09	1,329.14	114.05	8.6
Per cent. of expenses.	82.70	83.07	0.37	0.4

The earnings were divided as follows:

	Earnings.	Expenses.	Net or loss.	Earn. pr. mile.	P. c. of exps.
Washington Line	$605,799.82	$487,010.63	$118,789.19	$14,088	80.39
Pope's Creek Line	40,522.96	47,523.58	7,000.62	827	117.28
Total	$646,322.78	$534,534.21	$111,788.57	$7,025	82.70

Both lines showed a decrease; that on the Washington Line was chiefly in passenger earnings, owing to the absence in 1877 of the Centennial travel carried in 1876.

While the total expenses have been largely reduced, the requirements of the service have been amply met, the motive power and passenger and freight equipment kept up in numbers and condition, all bridges carefully maintained, the road bed and superstructure improved, and the mileage of track increased by 4,340 feet of new sidings. During the year 785 tons of steel rails were laid to replace iron, and 57,918 cross-ties used in repairs and siding extensions. Of the main track between Baltimore and Washington, 29 miles are now laid with steel. A coal wharf, with a connecting bridge crossing the main tracks of the Baltimore & Potomac and Northern Central roads, has been erected at the north end of the Baltimore tunnel for the purpose of coaling engines. This will save time and labor and the haul from Baltimore to Washington, where the coaling has been hitherto done. It is believed that all damages or causes of litigation resulting from the tunnel constructions have been at last finally settled. Thorough repairs have been made to all bridges on both the Washington and Pope's Creek lines, and upon the Long Bridge, over the Potomac River, south of Washington, the span of the south draw entirely renewed and lengthened about 50 feet, making the span the same length on either side of the pivot, and causing the draw to swing much more readily. On account of the high rate of speed maintained by most of the passenger trains on the Washington line it is intended to shortly replace the bridges thereon with iron structures. Special reference is made to the good conduct of the company's employés during the labor troubles of last year, and to the earnest efforts of Superintendent Wilkins to preserve order along the line.